HYPERION ENERGY CENTER UNION COUNTY

DENR'S RESPONSE TO COMMENTS RECEIVED ON THE

DRAFT PREVENTION OF SIGNIFICANT DETERIORATION PRECONSTRUCTION AIR QUALITY PERMIT

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1.0 Introduction

On December 20, 2007, RTP Environmental Associates Inc., on behalf of Hyperion Refining LLC, submitted a Prevention Significant Deterioration (PSD) preconstruction permit application to construct and operate a 400 barrel per day petroleum refinery and a 600 megawatt integrated gasification combined cycle (IGCC) power plant. Hyperion Refining and/or the Hyperion Energy Center will be referred to as "Hyperion" in this document.

The South Dakota Department of Environment and Natural Resources (DENR) decided shortly after receiving the application that hard copies of all documents associated with the application would be available to all interested parties in Pierre and at the Geological Survey Program located in Vermillion, South Dakota, and the documents could also be viewed on DENR's website at http://www.state.sd.us/denr/hyperionaq.htm. That will include this document and the proposed PSD air quality permit which represents DENR's final permit decision.

On February 20, 2008, DENR considered the application complete. On September 11, 2008, DENR public noticed the draft PSD air quality permit in four local newspapers in the area and placed DENR's Statement of Basis and draft PSD air quality permit on DENR's website. The public comment period was later extended until November 14, 2008, to provide everyone more time to review both documents.

DENR received approximately 3,000 comments from individuals, small businesses, environmental groups, the Environmental Protection Agency (EPA), National Park Service, and Hyperion. Of the approximately 3,000 that provided comments, approximately 2,800 support the issuance of the draft PSD air quality permit and approximately 200 are opposed to the issuance of the permit. A large portion of the individuals and small businesses took this opportunity to voice their support or opposition to Hyperion without providing any specific comments about the draft PSD air quality permit. Specific comments about the draft PSD air quality permit were received from:

- Individuals:
- Hyperion;
- EPA, Region VIII;
- Plains Justice;
- National Park Service, Midwest Region; and
- Jenner & Block, representing Citizens Opposed to Oil Pollution, Save Union County, and the Sierra Club.

DENR reviewed everyone's comments but no changes to the draft PSD air quality permit resulted from those that took this opportunity to support or oppose the project without providing specific comments. This document contains DENR's responses to the comments received during the public notice period. In cases where the comment resulted in a change to the draft PSD air quality permit, the changes may be viewed in the proposed PSD air quality permit with additions

to the permit represented in bold, blue, and underlined, and deletions represented in red with overstrikes. A summary of the comments and DENR's responses follows.

2.0 General Comments

2.1 Application

1. Jenner & Block allege that Hyperion's application is incomplete and that DENR could not have validated the emission estimates, determined the appropriate maximum emission inputs, or evaluated if the facility will meet PSD requirements without the information that is missing.

Response: Jenner & Block believes the composition of the crude oil that is being processed in the refinery is necessary for determining everyday and occasional emissions from the refinery and indicates that the process details necessary for calculating and verifying emissions were not included in the application. As required by 40 CFR §52.21(j), Hyperion must install what is considered the Best Available Control Technology (BACT). Hyperion's application contains a lengthy BACT analysis, which establishes the emission limitations the facility must meet for both the everyday and occasional emissions. These emission limitations are the basis for controlled emissions derived in Hyperion's application and used in the modeling analysis to ensure the emission limitations will comply with the National Ambient Air Quality Standards and PSD increments. The definition of potential to emit identifies that any physical or operational limitation on the capacity of the source to emit a pollutant including air pollution control equipment and restriction on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emission is federally enforceable. Once the PSD air quality permit is issued, the BACT emission limits are enforceable and may be used to define the potential to emit. The type of crude was not a direct factor in determining the BACT emission limitations for each of the emission units. The PSD regulations do not specify that all indirect factors should be analyzed to determine BACT. Therefore, the type of crude is not required.

Jenner & Block indicate that Hyperion simply states they used EPA computer models without providing inputs, modeling parameters, or outputs for the wastewater treatment system and storage tanks. In regards to where the BACT limit was not the direct derivation of the emission rates, Hyperion identified EPA's software programs or EPA's Compilation of Air Pollutant Emission Factors (AP-42 documentation). EPA's software programs are located on the internet at http://www.epa.gov/ttn/chief/efpac/efsoftware.html. Hyperion provided in the application a summary of the emissions derived from the EPA computer models and the data used in the tank model may be found in the application. For example, the input data for the Tanks software program were used by DENR to verify the calculations submitted by Hyperion. Hyperion identifies the volume of each tank in Appendix A of the application, the dimensions of each tank may be found in the modeling files that identify the building

parameters or by estimating the dimensions by knowing that volume is the height times "Pi" times the radius squared. The ratio of height to diameter is generally within 1:2 or 2:1 depending on the size of the tank. The number of turnovers may be obtained from the design rate of how many barrels of crude oil processed, gasoline produced, jet fuel produced, diesel fuel produced, and the number of tanks that store each product. Hyperion identifies the rim seal systems and deck characteristics in Appendix C of the application. The information DENR and the public could use to verify the emissions are found in the application and DENR's Statement of Basis.

Jenner & Block alleges that the application provides no information on the emissions of regulated New Source Review (NSR) pollutants from the flares other than the flare pilot gas combustion. As noted in 40 CFR Part 51, Appendix W, the ambient air quality analysis (modeling) considers the emissions during normal operations. This federal regulation notes in a footnote that malfunctions are not considered normal operations and should not be included in determining allowable emissions. Therefore, Hyperion is not required and DENR did not require the modeling analysis to include air emissions during a malfunction. The emissions from the refinery flares that Hyperion used in the modeling analysis included the emissions from the flares due to the pilot emissions used to maintain the flare in case of a malfunction. Hyperion has proposed to develop a gas recovery system that collects refinery gases during upsets that generally occur during startup and shutdown and known equipment failures. Therefore during these types of periods, which are commonly flared in other refineries, Hyperion is not allowed under the draft PSD air quality permit to use the refinery flares. There is still a possibility that an unknown equipment failure may occur that for safety reasons, the facility would need to flare. The emissions from the IGCC flares that Hyperion used in the modeling analysis included the emissions for the flares during startup and shutdown of the IGCC process. The emissions from the refinery flares and IGCC flares were used in the modeling analysis to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments.

Jenner & Block states that the fugitive emissions from the refinery were not broken out by process or area are unverifiable and will lead to improper or invalid modeling impact analyses. Jenner & Block did not specify which fugitive emissions were being discussed. It appears that the topic is on the fugitive volatile organic compounds emission from equipment leaks such as valves, pumps, and compressors. The application identifies the number of fugitive components, the estimated number of leaking equipment and associated emission factors to derive an emission rate. As noted in the Statement of Basis (page 148), there is no EPA approved model for volatile organic compounds, which is one of the precursors to the formation of ozone. In addition, in 40 CFR Part 51, Appendix W, the federal rule identifies there is no recommended ozone model for an individual facility. Therefore, there is no need to break down the fugitive emissions from equipment leaks into the specific areas of the facility.

Jenner & Block state that the design details required for air pollution control equipment were left blank in the application forms. The PSD air quality permit program is a preconstruction permit program used to establish the control equipment and emissions limits that a facility has to meet once it begins operation. As such, Hyperion has not purchased its equipment for the proposed project. Therefore, the manufacturer, manufactured date, installation date, manufacturer's design efficiency, manufacturer's operational and maintenance specifications are not available to include in the application.

Hyperion did provide enough information about the proposed Hyperion Energy Center for DENR and the public to verify emissions, establish BACT emission limits, and conduct modeling to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. As such DENR considered the application complete.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

2. Jenner & Block allege that Hyperion's application fails to provide adequate information to determine if there are additional emissions units whose emissions must be added to the emission calculations of the proposed facility. Jenner & Block specifically mentions characterization of or emissions from downstream finished product emissions units such as pumping station or gasoline bulk terminals and upstream raw material sources such as feeder pipelines.

Response: Hyperion certified in its application that "To the best of my knowledge, after reasonable inquiry, the statement and information contained in the application and supporting documents are true, accurate, and complete." In addition, it identifies in permit condition 1.1 that "If the owner or operator becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, such information shall be promptly submitted."

DENR's review is of the application submitted by Hyperion and not potential unknown business ventures. If at some point in the future, those types of operations are considered by Hyperion or by another entity; those projects such as a new gasoline bulk station will likely have to consider obtaining an air quality permit for its operations.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

- 3. Jenner & Block alleges that Hyperion's application fails to characterize any emissions of regulated NSR pollutants from numerous emissions units discussed or implied in the application. Jenner & Block claims the following emissions were not discussed:
 - The application provides no information on emissions of regulated NSR pollutants from flares other than from flare pilot gas combustion.

Response: DENR responded to a similar comment on the flare emissions which may be viewed in more detail in Comment #52 of this document.

 The application provides no information on emissions of volatile organic compounds, condensible particulate matter and carbon monoxide from the closed vent system for the wastewater collection system.

Response: DENR disagrees the application does not contain calculations for volatile organic compounds for the wastewater system. The volatile organic compounds emissions were calculated for API Separator, DAF Separator, and the Aeration Tanks based on an EPA software program called Water9 and the BACT requirement of 98 percent control. A pound per hour limitation was included as part of the BACT limits based on the information submitted. The volatile organic compound emissions from process drains were identified in the fugitive equipment calculations. In addition, the operation and monitoring requirements of the dual carbon canisters in essence generate negligible emissions.

• The application provides no information on the emissions resulting from the treatment of solid wastes associated with wastewater treatment (e.g., belt filter presses and wastewater treatment plant sludge storage).

Response: Jenner & Block did not provide any documentation identifying that particulate matter and or carbon monoxide emissions would be generated from the wastewater collection system prior to the catalytic oxidizer or volatile organic compounds or particulate matter from plant sludge storage. DENR reviewed its Statement of Basis, Hyperion's application, other state permits and permit decisions and could not locate any information on particulate matter and carbon monoxide emissions being generated by the wastewater treatment facility prior to the catalytic oxidizer or the plant sludge storage. If Hyperion becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, that information is required to be submitted promptly for consideration.

• The application provides no information on emissions resulting from maintenance coating and tank degassing activities.

Response: The maintenance coating, such as painting a building is not an activity that occurs on regular basis during a year. In addition, these infrequent activities and the extent of the activity is not reasonably available and are difficult to quantify. Fugitive emissions, to the extent those emissions are quantifiable, should be included in the emission calculations. The tank degassing activities are also not an activity that occurs on a regular basis. Even in that case, DENR is requiring a thermal oxidizer to be installed on a majority of the tanks to control the volatile organic

compound emissions. Emissions from the tank degassing activities will be required to be routed to the thermal oxidizer for treatment.

• The application provides no information on ammonia or hydrogen chloride emissions from the sulfur recovery unit thermal oxidizer vents.

Response: Ammonia and hydrogen chloride are not considered regulated NSR pollutants. Therefore, DENR did not request this information for the sulfur recovery unit thermal oxidizer vents.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

4. Jenner & Block allege that Hyperion's application does not provide details or equipment indications on how the slurry tank that feeds ground petroleum coke and coal to the gasification process will be accomplished. Jenner & Block claims that gasifier fugitive emissions and backflows must be controlled when charging solids and slurries to a pressurized gasifier. In addition, Jenner & Block states that if lock-hoppers are used, such devices will have a gas discharge and no details are provided on the disposition of gas from such devices.

Response: Jenner & Block did not provide any documentation identifying fugitive emissions would be generated due to backflows while charging solids and slurries to a pressurized gasifier. For fugitive emissions to account, those emissions must be quantifiable. DENR reviewed its Statement of Basis, Hyperion's application, other State's permit and permit decisions and could not locate any information on the types of emissions from these types of operations or methods to quantify. If Hyperion becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, that information is required to be submitted promptly for consideration.

Without additional information, DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

- 5. Jenner & Block alleges that Hyperion's application does not provide enough information to verify the emission characterizations of several regulated NSR pollutants. Jenner & Block claims the following:
 - The application does not provide a sufficiently detailed map of the site road network necessary to verify fugitive dust emission calculations which is necessary to properly require accurate spatial allocation of such emissions in the modeling analysis.

Response: The modeling files contain the parameters for the roads that were modeled, which includes the coordinates of each section of the road modeled, the base elevation, release height, horizontal and vertical dimensions, and the particulate

emission rates. DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

- The application fails to submit sufficient information to allow verification of sulfur recovery unit sulfur dioxide, hydrogen sulfide and total reduced sulfur emissions. No basis is presented for claim of 2,040 long tons per day. Jenner & Block recommends that the draft PSD air quality permit should be amended to place a 2,040 long ton per day operational restriction physically limiting the sulfur dioxide, hydrogen sulfide, and total reduced sulfur potential to emit of the six sulfur recovery units; and
- The application failed to provide adequate information regarding the destruction efficiency of the sulfur recovery unit thermal oxidizer during times of sulfur recover unit process sulfur flow transients to verify emissions of regulated NSR pollutants from the sulfur recovery unit thermal oxidizer.

Response: By including limits in pounds of sulfur dioxide per hour and pounds of sulfur dioxide per long ton, DENR is effectively limiting the rate of emissions from the sulfur recovery plant as represented in the application. In addition, DENR has agreed to require a 2,040 long tons of sulfur per day as an operational restriction for the six sulfur recovery units. A more detailed discussion on the sulfur recovery plant is discussed in Comment #78 of this document.

• The application does not contain sufficient information to verify if the carbon dioxide emission calculations included in Appendix H of the application is correct.

Response: Carbon dioxide is not considered a regulated NSR pollutant. A more detailed discussion on this topic is discussed in Comment #154 of this document. DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

The application does not provide sufficiently detailed information about the design
and configuration of wastewater sewage and transport system to verify if the closed
vent system to control volatile organic compound emissions from the wastewater
treatment units will also control volatile organic compounds emissions from the
facility wastewater sewer system.

Response: Permit condition 1.1 of the draft PSD air quality permit notes the closed vent system is designed to control the emissions from the oil/water separators and primary dissolved air floatation systems. Hyperion's application provides emission calculations from these systems. These closed vent systems are then controlled by a catalytic oxidizer. Permit condition 4.4 of the draft PSD air quality permit requires 98 percent control from the catalytic oxidizer. Chapter 10.0 of the draft PSD air quality permit requires performance tests of the catalytic oxidizer. In addition, permit condition 15.4 of the draft PSD air quality permit specifies the standards the closed vent system and catalytic oxidizer has to meet. In regards to the calculations of

fugitive emissions, Hyperion quantified the fugitive emissions from several sources such as valves, pumps, process drains, and roads. DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

• The application failed to provide adequate information on physical aspects and expected maximum process gas releases and emissions of the refinery flaring, venting, and pressure relief systems to verify compliance with the physical flare design performance objectives of 40 CFR §60.18.

Response: DENR has responded to a similar comment on the flare emissions which may be viewed in more detail in Comment #52 of this document. DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

6. A group of individuals requested DENR publish a simplified list of permitted contaminants with the total yearly limits.

Response: Hyperion identified in its PSD permit application the projected annual air emissions for Hyperion. Table 1-1 lists the annual air emissions found in Table 1.4-1 of Hyperion's application. The draft PSD air quality permit establishes BACT and associated air emission limits (e.g. pounds per hour, work practice standards), which will ensure the annual emissions listed in Hyperion's application will not be exceeded. In fact, the actual emissions from Hyperion are not allowed to exceed the BACT emission limits and therefore, the annual air emissions will be less than those listed in Table 1-1.

Table 1-1 – Hyperion Projected Air Emissions

Regulated Air Pollutant	Hyperion
Particulate matter 10 microns in diameter or less (PM10)	1,050 tons per year
Particulate matter 2.5 microns in diameter or less (PM2.5) ¹	1,050 tons per year
Sulfur dioxide (SO2)	863 tons per year
Nitrogen oxides (NOx)	776 tons per year
Volatile organic compounds (VOC)	507 tons per year
Carbon monoxide (CO)	2,005 tons per year

¹ – The particulate matter 2.5 microns in diameter or less (PM2.5) was estimated to be equivalent to the particulate matter 10 microns in diameter or less (PM10).

To help individuals in determining how Hyperion's projected annual air emissions compare to existing air emissions, DENR compared Hyperion's projected emissions to current existing air emissions. DENR used a 2002 study by EPA that determined air emissions from all counties in the United States for this comparison. The air emissions estimated by EPA in the South Dakota counties surrounding the Hyperion project are listed in Table 1-2. In addition, DENR is also providing the air emissions from counties in our neighboring states of Nebraska and Iowa surrounding the Hyperion project, which are listed in Table 1-3. These tables show Hyperion's projected air emissions in a

majority of the counties will be only a fraction of the emissions already being generated from existing sources.

Table 1-2 - South Dakota 2002 Emissions by County - Tons per Year

Pollutant	Hyperion	Union	Clay	Lincoln	Turner	Minnehaha
PM10	1,050	5,430	3,034	5,844	5,491	13,006
PM2.5	1,050	909	546	979	889	2,076
SO2	863	1,532	107	295	100	3,320
NOx	776	2,191	893	2,024	756	6,538
VOC	507	1,007	504	1,421	480	7,171
CO	2,005	8,853	3,279	11,861	3,061	44,346

Table 1-3 - Nebraska and Iowa 2002 Emissions by County - Tons per Year

		Cedar,	Dixon,	Dakota,	Sioux,	Woodbury,	Plymouth,
Pollutant	Hyperion	NE	NE	NE	IA	IA	IA
PM10	1,050	7,719	11,925	4,383	7,333	11,207	7,210
PM2.5	1,050	1,034	633	603	1,234	4,039	1,203
SO2	863	160	52	1,490	374	37,742	267
NOx	776	1,155	1,742	1,538	2,492	30,155	2,265
VOC	507	721	489	921	2,346	6,494	1,836
CO	2,005	6,553	4,239	6,226	14,107	40,077	12,906

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

7. EPA requested DENR include Hyperion's uncontrolled emissions in its analysis and provide documentation where annual emission rates titled "controlled emissions" in the Statement of Basis were derived. EPA and several individuals requested that the crude characteristics be better defined and discussed with other necessary permit assumptions so that a more complete understanding of refinery crude constituents and the ultimate refinery emissions can be developed. EPA requests at a minimum that these discussions include sulfur content, hydrogen/carbon ratio, and metal in the refinery's representative crude.

Response: EPA stated that DENR's analysis should include uncontrolled air emissions; but did not specify where this is required under the state and federal regulations. DENR reviewed the PSD regulations and did not find anywhere were the regulations require the potential uncontrolled air emissions to be submitted in an application. In addition, the definition of potential to emit identifies that "Any physical or operational limitation on the capacity of the source to emit a pollutant including air pollution control equipment and restriction on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emission is federally enforceable." Once the draft PSD air quality permit

is issued, the BACT emission limits are enforceable and may be used to define the potential to emit. As such, the uncontrolled emission rates are not required.

As required by 40 CFR §52.21(j), Hyperion is required to apply BACT to all equipment that emits a regulated NSR pollutant that would have the potential to emit in significant amounts. Hyperion's application contains a lengthy BACT analysis, which DENR reviewed and discussed in the Statement of Basis. Therefore, documentation for the controlled emissions are based on the BACT emission limits and operational limitations being proposed in the draft PSD air quality permit.

Although EPA and several individuals requested the characteristics of the types of crude Hyperion would be processing, the type of crude is not a direct factor in determining the BACT emission limitations for each of the emission units in the draft PSD air quality permit. The PSD regulations do not specify that all indirect factors should be analyzed in determining the BACT emission limitations. DENR specifies in the draft PSD air quality permit what maximum air emission rates are allowed and does not specify limitations on the crude characteristics. Therefore, no matter what the sulfur content is in the crude, Hyperion cannot emit sulfur dioxide above the BACT emission limitation identified in the draft PSD air quality permit. Therefore, the specific crude is not required.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

8. A group of individuals requested all equipment manufacturer's and equipment model numbers be specified in the draft PSD air quality permit and are necessary for calculating air emissions.

Response: The PSD air quality permit is required to be obtained prior to construction of the project. Final designs are generally not completed and the specific equipment is not generally purchased until the owner, in this case Hyperion, knows the specific limits and requirements in the draft PSD air quality permit. Therefore, the specific manufacturer is sometimes not available until after the PSD air quality permit is issued. However, the nominal size of the equipment necessary for determining air emissions, what state and federal regulations are applicable and BACT emission limits are listed in the application and the draft PSD air quality permit. Hyperion's PSD complete application contained the information DENR needed to estimate air emissions and determine what state and federal regulations and limits were applicable.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

2.2 BACT Analysis

9. EPA stated the short term BACT emission limits should be greater than the long term BACT emission limit. EPA's reason is that short term emission rates are typically greater than annual average emissions since the short term emission rate may reflect startup and shutdown periods as well as periods of peak load and production. EPA recommends additional information should be provided to support a revision to the short term limits.

Response: DENR disagrees with EPA that the short term BACT emission limits should be greater than the long term BACT emission limit. The BACT emission limits provided in the application were used in the model to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. The modeled BACT emission rates shown in Table 7-124 of the Statement of Basis are equal to or greater than the BACT emission limits established in Chapter 4.0 of the draft PSD air quality permit.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

10. A group of individuals asked why BACT was required instead of LAER and one individual stated LAER should be used.

Response: The PSD air quality permit program covers facilities such as Hyperion that propose to construct in areas such as South Dakota that are attaining the federal National Ambient Air Quality Standards. BACT is a requirement of the PSD air quality permit program. Areas that are not attaining the federal National Ambient Air Quality Standards such as areas in California are required to meet the Lowest Achievable Emission Rate.

The commenters did not specify a specific LAER requirement that was more stringent than that proposed in the draft PSD air quality permit. During DENR's research of what would be considered BACT, DENR did not find a BACT or LAER analysis which had a more stringent limitation at an existing refinery than those proposed in the draft PSD air quality permit for Hyperion.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

11. Jenner & Block alleges Hyperion did not conduct a proper BACT analysis by not identifying the applicable control strategies and control approaches but just simply stating BACT as a conclusion with no details or support.

Response: As defined in 40 CFR §52.21(b)(12), BACT means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act, which would be emitted from any proposed major stationary source or major modification which the Administrator, on a

case-by-case basis taking into account energy, environmental, and economic impacts and other costs, determines is achievable through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques, for control of such pollutant. In no event can the application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61. If it is determined that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such a standard is, to the degree possible, required to set forth the emissions reduction achievable by implementation of the design, equipment, work practice or operation, and is required to provide for compliance by means which achieve equivalent results.

In the regulations adopted by DENR, the methodology for the BACT analysis is not specified or described. In 1990, EPA did draft a guidance document that established a methodology that EPA felt should be used in a BACT analysis. However, EPA never finalized that document and never promulgated the guidance in regulations. Therefore, EPA's draft guidance may be used by applicants and/or the permitting agencies but is not an enforceable requirement of a BACT analysis.

Hyperion provided an extensive BACT analysis in the application. As noted in DENR's Statement of Basis, DENR reviewed the possible control technologies that are being used and considered the following areas in reviewing the applicant's BACT analysis, which are not all inclusive:

- Hyperion's PSD application;
- EPA's Reasonably Available Control Technology, Best Available Control Technology and Lowest Achievable Emission Rate Clearinghouse (generally referred to as the RACT/BACT/LAER Clearinghouse or RBLC);
- PSD permits issued to other petroleum refineries and/or IGCC power plants in other states;
- PSD permit applications for similar operations in other states;
- Rules and regulations in other states;
- Databases from other government resources; and
- EPA's technical documents.

DENR believes the identification of control technologies being used throughout the nation was conducted properly and does not recommend any changes to the draft PSD air quality permit as a result of this comment.

12. Jenner & Block states DENR's Statement of Basis and the draft PSD air quality permit contains no hydrogen sulfide or total reduced sulfur BACT review and emission limitations on fugitive emissions from process equipment components. In addition,

Jenner & Block alleges the draft PSD air quality permit fails to include details on fence line monitoring as mentioned in the application such as spatial coverage, methods that will be used, frequency of data collection or analysis, type of analysis, and pollutants to be monitored.

Response: Jenner & Block is correct in identifying DENR inadvertently did not include a discussion in the Statement of Basis and did not include emission limitation in the permit for fugitive emissions of hydrogen sulfide. Hyperion's application did include a BACT analysis for hydrogen sulfide and proposed a BACT requirement of an ambient monitoring network for hydrogen sulfide. DENR reviewed the following areas in reviewing the applicant's BACT analysis, which are not all inclusive:

- Hyperion's PSD application;
- EPA's Reasonably Available Control Technology, Best Available Control Technology and Lowest Achievable Emission Rate Clearinghouse (generally referred to as the RACT/BACT/LAER Clearinghouse or RBLC);
- PSD permits issued to other petroleum refineries and/or IGCC power plants in other states:
- PSD permit applications;
- Rules and regulations in other states;
- Databases from other government resources; and
- EPA's technical documents.

DENR agrees the ambient monitoring network for fugitive emissions of hydrogen sulfide is considered BACT with an ambient monitoring concentration of 0.03 parts per million by volume. DENR will include requirements for an ambient monitoring network. Since the detailed design of the facility has not been completed, the specific aspects of the monitoring plan are not available. However, DENR will revise the draft PSD air quality permit by adding permit condition 14.4 which will establish the minimum requirements for the Hydrogen Sulfide Monitoring plan. DENR will also establish a requirement in the permit condition 3.8 to submit summaries of any period that exceed the 0.03 parts per million by volume.

13. Jenner & Block states the application fails to carry out a "top-down" BACT demonstration for fugitive volatile organic compound emissions from facility process equipment components.

Response: DENR responded to a similar comment regarding "top-down" BACT demonstration in Comment #11 of this document.

Jenner & Block does not specify any documentation that supports that an entire refinery facility has included only leak less fugitive components as valves, pumps, and compressors. DENR reviewed several different facilities and could not locate where an oil refinery contained only leak less fugitive components. DENR required a leak detection and repair program that has to meet the requirements of 40 CFR Part 63 Subpart

H, 40 CFR Part 63 Subpart CC, and the permit conditions in Chapter 14.0. DENR agrees this is not specifically clear in the draft PSD air quality permit and will revise the permit by adding permit condition 4.9 which will identify BACT for equipment leaks is based on work practice standards.

14. Jenner & Block states the PSD rules definition of BACT includes a requirement that visible emission limitations be set as part of a PSD BACT determination and recommends that most enclosed combustion process sources should not be allowed visible emissions greater than 10% and elevated flares should be put under no smoking flare limit.

Response: DENR agrees it has the authority to establish an opacity limit in applying BACT. However, establishing an opacity limit is at the reasonable discretion of the permitting authority based on its case-by-case analysis of the facility. See *Alabama Power Co. v. Costle*, 636 F.2d 323 (1979), 407-409. DENR believes the PM10 BACT emission limits, testing requirements, etc. proposed in its draft PSD air quality permit are adequate to protect the National Ambient Air Quality Standards and PSD increments, and therefore it did not include a BACT opacity limit in the draft PSD air quality permit. DENR will note that Jenner & Block's recommendation for a no smoking flare limit is already in the draft PSD air quality permit under permit conditions 12.2 and 13.2.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

15. EPA and Jenner & Block believe Hyperion's cost analysis provided in the application was inadequate and additional information should be provided. The inadequacy is based on Hyperion not providing documentation such as vendor quotes or an engineering cost analysis showing how they derived the costs.

Response: The federal PSD regulations adopted by DENR do not specify a methodology that is required to be used in a BACT analysis. In 1990, EPA did draft a guidance document that established a methodology that EPA felt should be used in a BACT analysis. However, EPA never finalized that document and never promulgated the guidance as federal regulations. Therefore, EPA's draft guidance may be used by permitting agencies, but it is not an enforceable requirement of a BACT analysis.

DENR disagrees the costs are unsupported. For example, the analysis noted for the heater selective catalyst reduction system is similar to the costs noted in California's BACT determinations for a selective catalyst reduction system. If you take into account inflation and the increased cost of steel, the two costs are quite similar.

DENR could not locate an existing refinery that used the controls that were considered not cost effective as discussed in the cost analysis for the refinery fuel gas desulfurization, wastewater treatment plant, and tank farm vapor recovery system. Although EPA and Jenner & Block state there is not enough information to determine if the costs are

accurate, they did not provide any documentation that would suggest the costs estimated and identified in the application were excessive or unreasonable.

DENR did review the cost estimates to determine if we agreed or not. For example, one cost estimate we disagreed with was the cost of a thermal oxidizer system for the tank farm. Based on information DENR has on the cost of thermal oxidizers, DENR considered Hyperion's estimated costs of the tank farm thermal oxidizer excessive and unreasonable and requested additional information on those costs. A more detailed discussion on the costs of the tank farm thermal oxidizer may be found in the Statement of Basis (section 7.1.4.11) and Chapter 10.0 of this document.

DENR reviewed the cost estimates provided by Hyperion in the application and determined Hyperion provided sufficient information to determine an incremental cost per ton reduction for each of the proposed controls. In cases where additional information was needed, DENR requested information and it is part of the record.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

16. Jenner & Block states BACT was not required for unregulated pollutants.

Response: As defined in 40 CFR §52.21(b)(12), BACT means "an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act, which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis taking into account energy, environmental, and economic impacts and other costs, determines is achievable through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques, for control of such pollutant. In no event can the application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61. If it is determined that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such a standard is, to the degree possible, required to set forth the emissions reduction achievable by implementation of the design, equipment, work practice or operation, and is required to provide for compliance by means which achieve equivalent results."

The BACT analysis is a case-by-case analysis that may take into account energy, environmental, and economic impacts, in determining BACT. This case-by-case approach allows the permitting authority to consider the environmental impact a BACT decision may have. For example, the requirement of a thermal oxidizer to reduce volatile

organic compound emissions has the environmental impact to increase the emissions of regulated pollutants such as particulate matter, sulfur dioxide, nitrogen oxide, and carbon monoxide, which would not have occurred if it was not for the proposed control option. Therefore, these additional emissions need to be considered. Hyperion's application proposed the use of thermal oxidizers and these environmental impacts were considered.

Jenner & Block cites a 1991 EPA transitional guidance document indicating unregulated pollutants such as hazardous air pollutants should be considered in the BACT analysis under the environmental impact section. The guidance document references a 1986 Environmental Appeal Board decisions. However, that decision was superseded in 1990 by Congress when it revised the Clean Air Act and specifically exempted hazardous air pollutants from the PSD program.

Jenner & Block did not provide any documentation or specific comments where the proposed control option would cause an environmental issue that would preclude the use of the control technology.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

2.3 Permit Related

17. A group of individuals stated that they found it difficult to understand the draft PSD air quality permit. In addition, EPA noted that the format of the draft PSD air quality permit was somewhat confusing to review and understand.

Response: DENR understands the difficulty in understanding the draft PSD air quality permit, especially in this case where we are dealing with a large complicated facility subject to state and federal Clean Air Act regulations that are also complex. Although DENR goes to great lengths in writing its review and draft PSD air quality permit in laymen terms, one has to realize these documents address technical issues. In realizing this difficult task, DENR extended the public comment period for a total of 60 days to ensure individuals had time to review. In response, approximately 3,000 people and organizations provided comments on the draft PSD air quality permit.

DENR disagrees with EPA that a different format would make it less confusing or enhance compliance demonstration since we are still working with a large complicated facility and technical permit. DENR used the same format it has used in the past for writing air quality permits which EPA is familiar with and approved in the past.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

18. A group of individuals requested that several public meetings and/or hearings should be provided in the area of the proposed site to allow the public to better understand the draft PSD air quality permit and provide input.

Response: Hyperion has submitted a Petition for Contested Case Hearing in front of the Board of Minerals and Environment. A "Contested Case Hearing" is a formal adversarial proceeding that is conducted in a manner similar to a trial before a Judge. During a "Contested Case Hearing", parties have the right to be present, to present evidence through the testimony of witnesses and the offering of exhibits and documents, and to be represented by an attorney. These hearings are typically long, with detailed evidence presented by expert witnesses provided by all parties. Dates for the "Contested Case Hearing" are tentatively scheduled to begin in May 2009. Beside the official parties to the proceedings, the hearing is open to the public.

In addition, the Board of Minerals and Environment will hold a "Public Comment Hearing" on the proposed PSD air quality permit. Persons, corporations, associations or entities who are not participating as a Party in the "Contested Case Hearing" may appear and submit public comment on the proposed PSD air quality permit at the "Public Comment Hearing". The date, time and location of the "Public Comment Hearing" will be determined by the Board of Minerals and Environment, and notice of the "Public Comment Hearing" will be published in local newspapers and placed on DENR's website.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

19. A group of individuals asked what happens if Hyperion proposes changes to the permit such as building a coal fired power plant instead of an IGCC system.

Response: Hyperion submitted a PSD air quality permit application for a refinery and IGCC system. The draft PSD air quality permit addresses this proposed facility. If Hyperion chooses to change the proposed facility or a portion of the proposed facility (e.g. install a coal fired power plant instead of an IGCC system), Hyperion would need to submit an addendum to the PSD air quality permit application, DENR would need to review the application to ensure it meets all applicable PSD requirements, DENR would need to re-public notice the proposed changes to the draft PSD air quality permit for public comment, and possibly another "Contested Case Hearing" before the proposed change is approved.

Once the refinery and IGCC system is built and operational and Hyperion chooses at some point in the future to modify its operations, Hyperion would be required to submit an application for those changes. DENR would review the application to ensure all applicable state and federal regulations are being met, including a demonstration that the proposed modification would not cause an exceedance of the National Ambient Air

Quality Standards and PSD increments. In addition, the proposed modification is required to follow the same public procedural requirements as the current PSD air quality permit.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

- 20. EPA noted the draft PSD air quality permit has provisions that are in the form of which EPA calls "director's discretion". EPA recommends the following changes to the draft PSD air quality permit:
 - Permit condition 2.1 allows the Secretary to grant a permit term extension after the owner or operator satisfactorily demonstrates an extension is justified. EPA recommends that "satisfactorily" should be clarified.

Response: EPA identifies that the term "satisfactory" in permit condition 2.1 should be defined in regards to extending the 18-month construction deadline. The extension is based on 40 CFR §52.21(r)(2) and uses the same terminology in the federal regulation, which states that "The Administrator may extend the 18-month period upon a satisfactory showing that an extension is justified." In this regards the South Dakota's PSD regulations are the same as EPA's PSD regulations. Both sets of regulations do not define the conditions that have to meet to be considered satisfactory. It is based on the Administrator's judgment, which in this case is the Secretary since South Dakota's PSD air quality permit program is adopted in South Dakota's State Implementation Plan.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

• Permit condition 3.7 appears to indicate the draft PSD air quality permit could be revised so that Hyperion is no longer subject to a Startup, Shutdown and Malfunction plan. EPA recommends that this condition be clarified.

Response: EPA requested that DENR clarify in permit condition 3.7 how the owner or operator can get out of being subject to the Startup, Shutdown, and Malfunction plan. The language for the Startup, Shutdown, and Malfunction plan recordkeeping requirements was based on Startup, Shutdown, and Malfunction plan requirements in 40 CFR Part 63 (Maximum Achievable Control Technology Standards). As noted in 40 CFR §63.6(e)(3)(v), it states that "the owner or operator must retain a copy of the most recent plan for five years from the date the source ceases operation or is no longer subject to this part and must make the plan available upon request for inspection and copying by the Administrator." This permit condition specifies how long the owner or operator is required to maintain an obsolete version of the plan and current plans. DENR recognizes that in the future there may be better methods of demonstrating compliance during these periods than a Startup, Shutdown, and

Malfunction plan and if they are adopted, DENR, as well as EPA, wants to make sure Hyperion maintains the plan for an adequate period of time.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

 Permit condition 4.8 specifies the Startup, Shutdown and Malfunction plan shall be submitted and approved by the Secretary. In addition, permit condition 5.9 specifies that the Secretary shall approve the Operation, Maintenance and Monitoring plan. EPA recommends that these permit conditions be revised to specify the Secretary will approve the plan if the permit conditions and other applicable requirements are met.

Response: EPA does not provide any justification that its' recommended language to permit condition 4.8 and 5.9 adds anything to the two permit conditions. DENR believes this requirement is already inherent in the existing language of the draft PSD air quality permit.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

• Permit condition 5.10 specifies the Startup, Shutdown and Malfunction plan does not have to address any scenario that does not cause an exceedance of an applicable emission limit. EPA questions how this particular provision of the permit will be implemented and enforced. Permit condition 5.10 allows another plan to meet this requirement without any approval by DENR. EPA recommends that DENR maintain its approval authority. EPA also recommends that permit condition 5.10 clarify who determines if the plan needs to be revised.

Response: The language for the Startup, Shutdown, and Malfunction plan was based on Startup, Shutdown, and Malfunction plan requirements in 40 CFR Part 63 (Maximum Achievable Control Technology Standards). As noted in 40 CFR §63.6(e)(1)(i), it states "the startup, shutdown, and malfunction plan does not need to address any scenario that would not cause the source to exceed an applicable emission limitation in the relevant standard." DENR added this language based on the federal regulation to ensure the plan was not inundated with scenarios that would not cause a violation.

As noted in 40 CFR §63.6(e)(3)(vi), it states "To satisfy the requirements of this section to develop a startup, shutdown, and malfunction plan, the owner or operator may use the affected source's standard operating procedures (SOP) manual, or an Occupational Safety and Health Administration (OSHA) or other plan, provided the alternative plans meet all the requirements of this section and are made available for inspection or submitted when requested by the Administrator." Again DENR is taking language straight out of federal regulations. DENR disagrees with EPA that

permit condition 5.10 does not require the alternative plan to be approved. Permit condition 5.10 allows another plan provided the plan meets all of the requirements of the permit condition.

EPA recommended that permit condition 5.10 clarify who determines if the Startup, Shutdown and Malfunction plan is inadequate and needs to be revised. Permit condition 5.10 specifies that Hyperion is required to revise the plan if it believes it does not address the requirements in the draft PSD air quality permit. DENR has the right to request changes if they do not believe the plan addresses the requirements in the draft PSD air quality permit.

DENR recognized in another comment that revisions to the Startup, Shutdown and Malfunction plan were not required to be submitted and approved. DENR agrees that revisions to the plan should be submitted and approved and the revisions to the draft PSD air quality permit are specified in Comment #106 of this document.

• Permit condition 10.6 requires the performance test report be submitted within 60 days after completion of the tests or by another date specified by the Secretary. EPA recommends the ability for the Secretary to specify another date be removed.

Response: EPA does not provide any justification that the Secretary does not have the authority to specify another date if circumstances warrant an extension or an earlier date.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

• Permit condition 16.2 and 16.5(4) allow the Secretary to approve alternative methods for controlling dust emissions from unpaved roads and open storage piles, respectively. EPA recommends that this approval be removed because any changes to the BACT requirement must go through public notice and comment.

Response: The PSD air quality permit program establishes the control technology, emission limits, recordkeeping, and reporting requirements that a facility must meet once the facility begins operations and into the future. The PSD air quality permit program does not cover the emissions generated during the construction phase of the facility. Permit condition 16.2 and 16.5 are conditions that cover fugitive dust sources that will be likely present during the construction phase and not going to be present during the operations of the facility. DENR included those conditions to minimize dust emissions during the construction phase of the facility.

These conditions contain the work practices that DENR has approved that will maintain fugitive emissions less than fugitive dust emission limit of 20% opacity as required in permit condition 16.8 in the draft PSD air quality permit. In cases where

there are other work practice standards that can maintain dust emissions below the 20% opacity threshold or Hyperion is unable to maintain the fugitive dust emissions below 20% opacity, the permit is designed to allow the facility to recommend other work practices for the Secretary to approve. DENR believes the Secretary needs this approval authority to ensure compliance with the emission limit of 20% opacity. Since these requirements for changing the work practice standards are specified in the draft PSD air quality permit, the public has the opportunity to comment.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

21. One individual indicated the "pounds per hour" limits for PM10 in Table 4-1 of the draft PSD air quality permit added up to an annual emission rate of 1,463 tons per year. This is a greater emission rate when compared to Hyperion's application which only lists the PM10 emissions at 1,046. This same individual made this similar comment for sulfur dioxide in Table 4-2, and carbon monoxide in Table 4-5.

Response: Hyperion submitted a revision to its application which listed the total PM10 and carbon monoxide emissions at 1,050 and 2,005 tons per year, respectively. The revision is located in DENR's website under "DENR Correspondence", identified as "Revisions to Application Text" and dated May 15, 2008. The individual basically added all of the "pounds per hour" limits for each unit, multiplied it by 8,760 hours per year, and divided by 2,000 pounds per ton to estimate the annual emissions. In the case where there was more than one limit, the individual used the greatest emission limit. This method would be accurate in most cases except that there are operational limits in the permit. For example, permit condition 5.6 only allows four of the five combustion turbines to operate at any one time and permit condition 5.7 only allows six of the eight gasifier startup burners to operate at any one time. Another example are the footnotes in Table 4-1 and 4-2, which specify that the "pounds per hour" limit for the sulfur recovery plant trains is a combined limit, not an individual limit. All of the operational restrictions are relevant in determining projected annual emissions.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

22. A group of individuals stated some of the emissions appear to be permitted at higher levels than Hyperion requested.

Response: The individuals did not specify which limits were higher than those proposed by Hyperion. DENR revisited the emission limits to verify if the general statement was accurate and if so, which emissions appear to be permitted at a higher level than requested by Hyperion. In the draft PSD air quality permit there is an air emission limit for carbon monoxide, in pounds per million Btu and pounds per hour air emission limit. DENR did identify a few air emission limits where the pounds per million Btus limit did

not equate to the pounds per hour limit for carbon monoxide emissions for the process heaters. DENR revised these differences in Table 4-5 using the lowest emission rate and revised the draft PSD air quality permit appropriately.

23. Jenner & Block claims that the footnotes in Chapter 4.0 of the draft PSD air quality permit modifies the effect of each emission limitation referenced depending on what data is used to measure and determine compliance and objects to the 365-day averaging time qualifier because: 1) it impermissibly changes the meaning and stringency of the short term BACT emission limitation; 2) it adds a substantial layer of needless complexity and does not departs from traditional New Source Performance Standards quarterly emission reporting and compliance evaluations; and 3) the National Ambient Air Quality Standards and PSD increment analysis is based on the BACT emission limit in the draft PSD air quality permit.

Response: It appears from Jenner & Blocks comment that they believe the BACT emission limits must have short term averaging times to demonstrate compliance but do not identify in the state or federal regulations where this assumption is based on. DENR agrees that the BACT emission limits used in the modeling analysis to demonstrate compliance with the National Ambient Air Quality Standards and the PSD increments must be established in the draft PSD air quality permit and the method of demonstrating compliance should be similar in time frame to the time frame used to demonstrate compliance with the National Ambient Air Quality standard and PSD increment. Therefore, DENR does agree that compliance with the pounds per hour emission rate used in the modeling analysis should be on a short term basis for those pollutants that have a short term National Ambient Air Quality Standard and provided there is a methodology to demonstrate compliance with the pounds per hour limitation.

The use of the 365-day average was intended and proposed by Hyperion to apply to the pounds per ton, concentrations in parts per million, and pounds per million Btus emission rates. The equipment and control equipment are optimized where the system will likely operate the majority of its time. The equipment is not optimized for those operations that are not frequent operations such as startup and shutdown. The emissions on a pound per million Btus or a pound per ton basis are likely to be higher during startup, shutdown, and/or malfunctions. Whereas, the maximum emission rate in pounds per hour that was used in the modeling will likely be less during a startup and shutdown period. An example of this scenario was discussed in more detail in the response to EPA's comments on the nitrogen oxide emission BACT limit (see Comment #60 of this document).

For several units, DENR will revise the chapter 4.0 to include pounds per hour emission limitations with compliance demonstrations based on the performance tests, continuous emission monitoring system or the startup, shutdown and malfunction plan with corresponding averaging times similar to the National Ambient Air Quality Standards.

24. One individual asked why the term "filterable and condensible" was included in the BACT emission limit for particulate matter.

Response: DENR assumes the individual is referring to permit condition 4.1, which identifies the BACT emission limit for PM10. The BACT emission limit for PM10 is identified as "filterable and condensible" to specify what Hyperion must test for to demonstrate compliance with the BACT emission limit. Filterable is the material collected on a filter during a stack performance test while condensible material passes through the filter in a gaseous state and is collected by condensing it in a container. Both the filterable and condensible material are added together to determine compliance with the BACT emission limits for PM10 that specify "filterable and condensible".

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

25. Jenner & Block alleges many of the draft PSD air quality permit requirements are not practically enforceable because there is no operating rate described in the draft PSD air quality permit for most units. Jenner & Block states many of the permit limits for individual emission units are only rate based (e.g., pounds per million Btu) and have no mass emission limits (e.g., tons per year or pounds per hour).

Response: Jenner & Block identified the draft PSD air quality permit lists the nominal rate in the permit for each of the units, which Jenner & Block states is just a descriptive rate and does not establish the maximum rate at which each unit can operate. DENR does agree the nominal rate does not establish the maximum operating rate of the equipment. However, the nominal rate does establish the design rate an applicant is proposing to construct. When new facilities are being proposed, the maximum rate of a piece of equipment is generally not known until the unit is purchased and operated. The maximum operating rate will be submitted in the Title V air quality permit application and established in the Title V air quality permit which includes public participation.

DENR does not agree the permit limits for individual emission units do not have a mass emission limits such as tons per year or pounds per hour. Jenner & Block identifies Table 4.4 in the draft PSD air quality permit as its example, which is the BACT emission limit for volatile organic compounds. Jenner & Block fails to recognize the BACT emission limit for particulate matter, sulfur dioxide, nitrogen oxide, carbon monoxide, sulfuric acid mist, and hydrogen sulfide contain mass emission limits. In many instances, a unit is required to meet both a pounds per MMBtu or pounds per ton and the pounds per hour emission limitations, which effectively limits the operational capacity of the unit. DENR also included a limit on the size of the refinery by including the operational limit on the crude oil that may be processed.

Therefore, the draft PSD air quality permit does contain mass emission rates for each unit to ensure compliance with the BACT emission limits used in the modeling analysis that

demonstrates compliance with the National Ambient Air Quality Standards and PSD increments, except for those operations which DENR determined were impractical to establish numerical limits such as flares and fugitive dust emissions. In these cases, a flare minimization plan and fugitive dust controls are put in place to minimize emissions.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

26. Jenner & Block makes an overall claim the draft PSD air quality permit must include additional physical throughput or production rate requirements to limit the potential to emit. The only specific examples Jenner & Block provide relate to no limitation on coal/coke charge to the IGCC plant and no operational limit on cooling tower water recirculation rate to limit the potential to emit of the cooling towers.

Response: Jenner & Block's comment is similar to an earlier comment which DENR has responded to in Comment #25 and #94.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.0 Air Quality Analysis

3.1 Modeling Inputs

27. Jenner & Block states that Hyperion is required to use the maximum allowable short-term emissions from Hyperion in the modeling analysis to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments based on EPA's 1990 draft New Source Review Workshop Manual.

Response: DENR agrees the BACT emission rates that Hyperion used in the modeling analysis to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments should be the maximum allowable BACT emission limits in the draft PSD air quality permit. It is difficult for DENR to determine exactly which BACT emission limit in the draft PSD air quality permit Jenner & Block is specifying; but the modeled BACT emission rates identified in Hyperion's application and shown in Table 7-124 of the Statement of Basis are equal to or greater than the BACT limits established in Chapter 4.0 of the draft PSD air quality permit.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

28. Jenner & Block believes Hyperion's modeling demonstration cannot be approved because Hyperion used annual average emissions for short term emissions for both Hyperion

emission sources and cumulate sources and fails to ensure the appropriate stated short term emission inputs are used in the model.

Response: The modeled BACT emission rates identified in Hyperion's application and shown in Table 7-124 of the Statement of Basis are equal to or greater than the BACT limits in Chapter 4.0 of the draft PSD air quality permit. The BACT emission rates demonstrated compliance with the short term and long term National Ambient Air Quality Standards and PSD increments.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.2 Impact Area

29. Plains Justice claims the air quality impacts modeling completed by Hyperion is flawed because the radius of 12 kilometers used in the analysis does not cover impacts in Iowa. Plains Justice states without including Iowa receptors, the modeling results give an inaccurate portrayal of the air quality in the region. In addition, Plains Justice alleges emissions from the flares are not included in the modeling analysis.

Response: Plains Justice questions the area covered by the receptor grid used in Hyperion's and DENR's modeling analysis. The spatial extent of the receptor grid used in DENR's modeling was designed to cover the area that Hyperion's emissions would have a significant impact. In 40 CFR §52.21(b)(15), the term baseline area defines the area in which a facility will have a significant impact. The term baseline area or impact area refers to a one microgram per cubic meter concentration based on the annual average emissions from the proposed facility. EPA acknowledges this in its 1990 draft New Source Review Workshop Manual (page C9). EPA notes that a significant impact is defined as a one microgram per cubic meter footprint annual increase. In addition, EPA identified significant modeling thresholds for the short term averaging periods also in its 1990 draft New Source Review Workshop Manual. Using these thresholds, Hyperion identified in Table 6-1 of Appendix E of its application that the farthest annual significant impact would be 3.2 kilometers from the proposed facility and that the farthest short term significant impact would be 11.8 kilometers from the proposed facility. The predicted impacts attributable to Hyperion were negligible beyond the spatial extent of the receptor grid used. Reducing the spatial extent of the receptor grid allowed for modeling with a finer receptor grid in order to identify the area of maximum impact attributable to Hyperion. DENR believes the spatial extent of the modeling grid was appropriate in this case.

The commenter states the emissions from the flares were not included in the modeling analysis. However, the modeling analysis includes several flares. Table 7-123 and 7-124 list the flares under the following Modeled IDs: IGCCFL1, IGCCFL2, FLARE 1, FLARE 2, FLARE 3, FLARE 4, and FLARE 5. The flares where modeled as point sources

which is an acceptable method of modeling flares in AERMOD, which is the EPA approved modeling program to determine air quality impacts.

DENR believes the spatial extent of the modeling grid was appropriate in this case and the flares were included in the modeling. DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

30. EPA recommended that increment consumption from the proposed Big Stone II facility should be included in the modeling analysis if that facility had a complete PSD application prior to the Hyperion analysis and the Big Stone facility is within the impact area of Hyperion. EPA basis for recommending this is that any nearby PSD increment sources that cause a significant concentration gradient in the vicinity of Hyperion should be modeled at short term emission rates to show compliance with the PSD increments.

Response: The proposed Big Stone II facility will be located in the northeast corner of South Dakota which is approximately 300 kilometers from Hyperion's proposed location, which is in the southeastern corner of South Dakota. Based on the significant impact modeling analysis conducted by Hyperion, the farthest short term significant impact will be approximately 11.8 kilometers from the proposed site. The proposed Big Stone II facility is not within the impact area of Hyperion.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

31. Jenner & Block believes the modeling Hyperion and DENR conducted failed to use a domain of modeled receptors with a sufficient spatial extent to properly assess ambient air quality impacts from both elevated sources at Hyperion and from cumulative sources in the National Ambient Air Quality Standards and PSD increment analysis. Jenner & Block recommends the modeling analysis be conducted at a radius of 50 kilometers because that is the domain of the model and is required to cover cumulative sources.

Response: DENR agrees the maximum radius allowed for use in AERMOD is 50 kilometers; but disagrees the modeling domain for the receptors should cover the 50 kilometer radius of the model. In accordance with 40 CFR §52.21(b)(15), the baseline area is an area in which the major source would have an air quality impact equal to or greater than 1 microgram per cubic meter (annual average) for each pollutant to determine the extent of impact from the proposed facility. This is referred to as the annual significant impact area. Hyperion determined the annual significant impact area and DENR expanded that area by 50 kilometer in radius to determine the increment consuming sources and sources that may have an impact on that area. Hyperion obtained a list of sources and the emission inventories for those sources from the state of Iowa, Nebraska and South Dakota. As Hyperion and DENR refined its modeling, the modeling domain was reduced because the impacts that could be attributed to Hyperion were negligible beyond that domain based on the significant impact modeling analysis.

Reducing the modeling domain allowed for modeling with a finer receptor grid in order to better identify the area of maximum impact.

DENR believes the modeling analysis Hyperion and DENR performed identified the area of maximum impact and included cumulative sources that would impact the baseline area.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

32. Jenner & Block recommends the cumulative analysis for PM10 should include all of the relevant sources in a 50 kilometer radius, including those that were screened out using a screening procedure known as the North Carolina D20 method. Jenner & Block believes if they were included there may be modeled exceedances of the 24-hour PM10 PSD Class II increment.

Response: Jenner & Block is correct that the North Carolina D20 method was used in identifying sources to include and exclude in the increment analysis. To verify exclusions, DENR modeled 100, 200, and 300 tons per year volume sources to determine at what distance these types of sources would impact the significant impact area. This analysis verified that the sources excluded from the analysis would not impact the significant impact area.

DENR disagrees that Figure 4-1, referenced by Jenner & Block, is an illustration of the modeling domain. It is an illustration of the receptor grid used in the modeling analysis. The modeling domain itself covered a broader area and did include emissions from increment consuming sources in Iowa and Nebraska over 60 kilometers from Hyperion's planned location. The spatial extent of the receptor grid used in DENR's modeling was based on the significant impact modeling analysis that predicted where the impacts attributable to Hyperion were negligible beyond the spatial extent of the receptor grid. Reducing the spatial extent of the receptor grid allowed for modeling with a finer receptor grid in order to identify the area of maximum impact attributable to Hyperion.

Hyperion's modeling analysis and DENR's review of the analysis demonstrates that Hyperion will be in compliance with the National Ambient Air Quality Standards and PSD increments.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.3 Ambient Air Background

33. Plains Justice provides a table that illustrates the ambient PM2.5 concentrations at Sioux City, Iowa for calendar year 2007 and 2008. This table was derived from the ambient PM2.5 concentrations from EPA's AirData available on EPA's website. Plains Justice

states that Sioux City has exceeded the 24-hour PM2.5 National Ambient Air Quality Standard of 35 micrograms per cubic meter in 2007 and 2008 and alleges that any additional PM2.5 emissions in the region will exacerbate the exceedances of the 24-hour National Ambient Air Quality Standard in that area.

Response: After reviewing the ten highest PM2.5 concentration days for the Sioux City Site for 2006 and 2007 and the four highest PM2.5 concentrations for 2008 along with the daily summary of meteorological data from the Sioux City Airport, it appears the proposed facility will not increase the levels collected at this site in Iowa on the high concentration days. The ambient PM2.5 concentrations for 2006, 2007, and 2008 may be viewed in Table 3-1, 3-2, and 3-3, respectively. Wind direction on all but two sampling days is out of a direction that would show Hyperion would not have an impact in Sioux City, Iowa. Wind speeds are low on even the two days with wind direction from the north-northwest which may indicate impacts from sources close to the monitoring site. Many of the high concentration days are during periods of low air mixing conditions indicated by fog and moisture which also may indicate impacts from sources close to the monitoring site.

Table 3-1 – 2006 10 Highest PM2.5 Concentration Days at Sioux City, Iowa

I ubic	Table 5-1 – 2000 10 Highest 1 112.5 Concentration Days at Sloux City, 10wa								
		PM2.5	Wind						
No.	Date	Concentration	Direction	Wind Speed	Comments				
1	07/04/06	$29.9 \mu/m^3$	NNE	7 mph					
2	02/28/06	$29.1 \mu/\text{m}^3$	ESE	10 mph					
3	10/26/06	$29.0 \mu/m^3$	NE	9 mph	Haze				
4	08/12/06	$23.0 \mu/\text{m}^3$	SE	11 mph	Haze/Clouds				
5	06/16/06	$22.1 \mu/\text{m}^3$	WSW	13 mph	Rain/Fog				
6	01/02/06	$21.3 \mu/\text{m}^3$	NNW	11 mph	Rain/Snow				
7	06/28/06	$20.8 \mu/m^3$	NE	4 mph					
8	01/23/06	$20.1 \mu/m^3$	S	12 mph	Fog				
9	11/22/06	$20.0 \mu/m^3$	ESE	8 mph					
10	08/09/06	19.4 μ/m^3	ESE	8 mph					

Table 3-2 – 2007 10 Highest PM2.5 Concentration Days at Sioux City, Iowa

		PM2.5	Wind		• /
No.	Date	Concentration	Direction	Wind Speed	Comments
1	12/20/07	$45.7 \mu/\text{m}^3$	ESE	6 mph	Fog
2	03/07/07	$36.7 \mu/m^3$	Е	9 mph	
3	01/21/07	$31.2 \mu/\text{m}^3$	NE	3 mph	Fog/Snow
4	06/16/07	$27.4 \mu/\text{m}^3$	ESE	6 mph	Rain
5	12/17/07	$27.4 \mu/m^3$	ESE	10 mph	
6	12/29/07	$26.7 \mu/\text{m}^3$	ESE	2 mph	Fog
7	02/11/07	$24.5 \mu/m^3$	SSE	8 mph	
8	03/28/07	$21.6 \mu/m^3$	ESE	15 mph	Rain

		PM2.5	Wind		
No.	Date	Concentration	Direction	Wind Speed	Comments
9	05/21/07	$20.2 \mu/\text{m}^3$	S	20 mph	
10	07/02/07	$20.1 \mu/m^3$	S	12 mph	

Table 3-3 – 2008 Four Highest PM2.5 Concentration Days at Sioux City, Iowa

		PM2.5	Wind	_	
No.	Date	Concentration	Direction	Wind Speed	Comments
1	02/03/08	$37.6 \mu/m^3$	NNW	7 mph	Fog
2	04/15/08	$27.8 \mu/m^3$	S	25 mph	
3	04/09/08	$20.0 \mu/\text{m}^3$	ESE	9 mph	Fog/Snow
4	02/27/08	$19.0 \mu/m^3$	ESE	1 mph	

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

34. Jenner & Block and several individuals recommend that Hyperion's modeling analysis for PM2.5 should have used PM2.5 background data from Sioux City, Iowa because it represents the highest concentrations close to the proposed site, that five years of background data should have been used in the analysis, and the analysis would show an exceedance of the 24-hour PM2.5 National Ambient Air Quality Standard if Sioux City, Iowa's background data was used in the analysis.

Response: The proposed facility location is a rural location with no large sources of air pollution located near the site. The proposed facility is about 26 miles from Sioux City and 47 miles from Sioux Falls. These cities have air monitoring sites with data that are the closest to the proposed facility. Jenner & Block did not take in consideration several issues that DENR reviewed when selecting the background site. They are as follows:

- The selection of PM2.5 data from the Sioux Falls or Sioux City sites would establish a background that would over estimate the concentration at the proposed facility location because there are more PM2.5 emitting sources in an urban area versus a rural area. Both air monitoring sites are miles from the proposed site and concentrations from these two cities would be reduced by dispersion before reaching this area. Therefore, the use of the highest background level will overestimate the actual impacts to the area around the proposed facility for both PM2.5 and PM10.
- The Sioux Falls Hilltop site had data for sulfur dioxide, nitrogen dioxide, ozone, PM10 and PM2.5 for 2006. The Sioux City site does not have data for sulfur dioxide, nitrogen dioxide and ozone.
- Meteorological data was available from the Sioux Falls Airport for the five year period.
- The Sioux Falls, Minnehaha County area has lower emissions inventory levels than in the Sioux City, Woodbury County area. Therefore, the Sioux Falls Hilltop site would

- have concentrations for background levels that are more representative of the proposed site.
- The PM10 modeling analysis overestimates the impact levels of PM2.5 since they are using PM10 emission rates in the analysis, so it is important to reduce the impacts from an overestimated background level.
- DENR personnel know the quality and quantify of data collected at the Hilltop site and were also knowledgeable about sources around the area. No information was known about the sources in Iowa and the monitoring site data collected in Sioux City.
- PM10 concentrations are affected by localized sources and levels drop quickly when
 moving away from the source. The most representative concentration again would be
 the Sioux Falls Hilltop site. The proposed facility is in a rural location with no major
 sources near the site. Using the Sioux City site located near major sources and in a
 city would greatly over state the background level and would be the least
 representative of this rural location.

DENR agrees with Jenner & Block that the permitting authority must require the use of background ambient air quality monitoring data from the most appropriate air quality ambient monitoring site to determine criteria pollutant background concentrations when there is no ambient air quality monitoring data from the facility site. However, DENR disagrees that picking the site with the greatest concentration is the most appropriate site for the background data. In DENR's judgment, the most appropriate site is the Hilltop site in Sioux Falls, South Dakota.

Jenner & Block cites EPA's "Example Air Quality Analysis Checklist" as its support of their claim that federal regulations require the applicant to use five years of background data in demonstrating compliance with the National Ambient Air Quality Standards. The checklist Jenner & Block referred to was developed in June 1978 and is not consistent with the requirements in the current rule under 40 CFR Part 51 or EPA's "Air Monitoring Guidelines for Prevention of Significant Deterioration (PSD)" written in 1987.

In accordance with 40 CFR §52.21(m)(b)(iv), it states in general a period of at least one year of data is required and the applicant may use less than one year of data if approved. There is no discussion in this section about using data collected from numerous years of testing. In addition, EPA's guidance document for the "Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)" states in Section 2.5 that one year of data is needed. Section 2.5 also makes reference to options for less than one year of data in some circumstances. No statements are made on requiring more than one year of data.

When a source of background data was requested from DENR in 2007, the 2006 sampling year was the most current year of data that was complete. DENR determined, based on the above factors that the Hilltop site located in Sioux Falls, South Dakota, had the air monitoring data that best represented background concentrations for southeastern South Dakota and would provide a conservative approach for the rural site proposed in the application.

DENR disagrees with Jenner & Block that five years of background data is required for the National Ambient Air Quality Standards and PSD increment evaluations. DENR believes that current state and federal regulations support its decision to use the one year of data that DENR believes best represents the background data for the proposed site.

DENR found during its review that the applicant followed the proper procedures in its modeling analysis and demonstrated that both the National Ambient Air Quality Standards and PSD increments will not be exceeded.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.4 Modeling Results

35. A group of individuals suggested the proposed project will generate air pollution that will be unhealthy to breathe because it was not adequately analyzed or explained. In addition, a group of individuals state there is no special protection for those living close to the plant.

Response: The individuals do not identify a specific issue on why the air quality will not be healthy to breathe, why it was not adequately analyzed or explained, or why special protection is necessary for those living close to the plant. DENR is providing an overall response to that generic comment. Section 160 of the Clean Air Act notes that the purpose of the PSD air quality permit program is the following:

- To protect public health and welfare from any actual or potential adverse effect which in the Administrator's judgment may reasonably be anticipated to occur from air pollution or originate as emissions to the ambient air, notwithstanding attainment and maintenance of all national ambient air quality standards;
- To preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreation, scenic, or historic value;
- To insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources;
- To assure the emissions from any source in any State will not interfere with any portion of the applicable implementation plan to prevent significant deterioration of air quality for any other State;
- To assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision making process.

The National Ambient Air Quality Standards established through the federal Clean Air Act in 40 CFR Part 50 have been adopted by DENR in the Administrative Rules of South

Dakota (ARSD) 74:36:02. The National Ambient Air Quality Standards were established to protect human health, safety, and welfare. The standard applies if you live close to a facility or if you live miles away. South Dakota does not have a nonattainment area, which is an area not meeting the National Ambient Air Quality Standards.

Hyperion's application and DENR's review of that application indicates that the National Ambient Air Quality Standards and PSD increments would not be exceeded at Hyperion's fence line or miles away from the facility. Therefore, the clean air next to the plant, in Union County and neighboring counties and states will still remain clean and maintain the standard established by EPA to protect human health, safety, and welfare. In addition, Hyperion's application and DENR's review indicates that no adverse impact to visibility, soil and vegetation in these areas will occur.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

36. The National Park Service pointed out the PM10 modeling analysis results for the short-term averaging periods are very close to both the National Ambient Air Quality Standards and PSD increments. The National Park Service stated that the Statement of Basis: 1) did not specify what emission rates were modeled and if they were the appropriate rates for the average period of concern; 2) the applicant may have only relied on the annual significant impact level of 1 microgram per cubic meter; 3) does not discuss how the emission inventories were developed; and 4) does not identify if the Missouri National Recreational River and Lewis and Clark National Historic Trail fall within the impact area for the National Ambient Air Quality Standards and PSD increment analysis.

Response: The National Park Service states the Statement of Basis did not include the modeled emission rates and whether they were the appropriate rates for the averaging period of concern. However, Table 7-124 in the Statement of Basis lists the emission rates of the modeled sources in terms of pounds per hour and identifies them as short-term emission rates. The short-term emission rates were used to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments.

The National Park Service questions the emissions source inventory used in the increment analysis of Hyperion's modeling. To identify the screening area, a 50 kilometer radius was added to the significant impact area. The maximum distance to significant impact was determined for each pollutant. Once the distance to a significant impact was determined, increment inventories were determined by locating all sources within the significant impact areas plus 50 kilometers. The North Carolina D20 method was then applied to the source inventory to determine increment consuming sources to be included in the increment modeling.

The National Park Service asks if the Missouri National Recreational River or the Lewis and Clark National Historic Trail fall within the significant impact area for Hyperion.

The maximum distance to a significant modeled impact on an annual bass was 3.2 kilometers and the significant modeled impact on a short term average was 11.8 kilometers. The minimum distance to either park is 13 kilometers; therefore the parks are outside the modeled significant impact area.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.5 Ozone Modeling

37. Jenner & Block recommends DENR require ozone modeling to assess the impacts of the project emissions on ozone air quality in Union County and other nearby areas.

Response: As noted in the Statement of Basis (page 148), there is no EPA approved model for volatile organic compounds, which is one of the precursors to the formation of ozone. In addition, 40 CFR Part 51, Appendix W identifies there is no recommended ozone model for an individual facility. DENR is currently in the process of setting up an ozone monitor to verify the ozone standard will not be exceeded

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.6 PM2.5 Modeling

38. Plains Justice states the draft PSD air quality permit must contain BACT emission limits for PM2.5 to ensure the National Ambient Air Quality Standards for PM2.5 will not be violated and to protect the public health of Iowans and South Dakotans. Plains Justice also states the PM2.5 analysis should include precursors like ammonia and condensible particulates. In addition, Jenner & Block believes Hyperion failed to include condensible particulate in the PM2.5 and PM10 air quality modeling analysis, which causes such modeling results to be understated.

Response: EPA issued a guidance regarding these issues. On October 23, 1997, a memo issued from John Seitz of EPA states that until PM2.5 implementation tools were available, permitting authorities should use PM10 as a surrogate for PM2.5 in meeting the PSD requirements. On April 5, 2005, a memo issued from Stephen Page of EPA reaffirmed EPA's position that permitting authorities and sources should use PM10 as a surrogate for PM2.5 in meeting the PSD requirements. In addition, EPA clarified the two memos in its final rule for the implementation of New Source Review Program for PM2.5 published in the May 16, 2008 federal register. EPA stated that a State Implementation Program approved state may use PM10 as a surrogate until the state has revised its State Implementation Program. EPA stated that if a source meets PSD program requirements for controlling PM10 emissions and analyzes those impacts on PM10 air quality, PM10 will serve as a surrogate approach for reducing PM2.5 emissions and protecting air

quality for PM2.5. The basis for this decision is that PM2.5 is "fine" particulate matter equal to or less than 2.5 microns in diameter and is a subset of PM10, which includes both "fine" and "coarse" particulate matter. Coarse particulate matter is greater than 2.5 microns in diameter and equal to or less than 10 microns in diameter. Therefore, using PM10 as a surrogate for PM2.5 means that both fine particulate matter and coarse particulate matter will be analyzed, rather than just fine particulate matter. The PM10 emissions determination thus will reasonably account for PM2.5 precursors as well as particulate matter larger in size than 2.5 microns.

DENR required Hyperion to model and perform a BACT analysis for PM10 and demonstrate compliance with PM10 National Ambient Air Quality Standards and PSD PM10 increments. By demonstrating compliance with PM10, in accordance with EPA's memos, Hyperion has satisfactorily demonstrated compliance with the PM2.5 National Ambient Air Quality Standards. DENR included the PM10 emission limits, used by Hyperion in the modeling to demonstrate compliance, as permit limits in the draft PSD air quality permit.

Currently, there is no EPA approved model for PM2.5 emissions and related precursors such as sulfur dioxide, nitrogen oxide, volatile organic compounds and ammonia. Even so, Hyperion submitted a PM2.5 air quality analysis. The PM2.5 analysis still used PM10 as a surrogate but in this analysis they used models developed for PM10 emissions, PM10 emission rates for point sources, and in some cases, PM2.5 emission rates for volume sources such as roads, and demonstrated compliance with the PM2.5 National Ambient Air Quality Standards. Again, the PM10 emission rates for the point sources used in the model were included in the draft PSD air quality permit as limits.

DENR accepted Hyperion's analysis using PM10 and PM2.5 emission rates in a PM10 model to demonstrate compliance with the PM2.5 National Ambient Air Quality Standards. The PM10 emission rates for the point sources used in the model were included as limits in the draft PSD air quality permit. Hyperion's PM2.5 analysis provides a conservative demonstration since they used PM10 emission rates instead of PM2.5 emission rates in the model and compared the results to the standard established for PM2.5, to demonstrate compliance with the PM2.5 National Ambient Air Quality Standards. Therefore, DENR's analysis of Hyperion's application satisfies the PM2.5 requirements and demonstrates that the National Ambient Air Quality Standard for PM2.5 will be met.

In addition, EPA has not promulgated a stack test method for PM2.5 emissions. Therefore, the tools necessary for conducting a direct PM2.5 analysis are not available, but the PM10 surrogate fills this requirement as per EPA's policy memos.

In the case of PM10, the pounds per hour BACT emission limits in Chapter 4.0 of the draft PSD air quality permit include both filterable and condensible particulate. Therefore, condensible particulate was included in the modeling analysis.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

39. Jenner & Block believes Hyperion PM2.5 modeling analysis, which resulted in a concentration of 11.3 micrograms per cubic meter, exceeds the PM2.5 24-hour PSD Class II increment of 9 micrograms per cubic meter recently proposed by EPA on September 21, 2007.

Response: Jenner & Block is correct in that EPA proposed a PM2.5 24-hour PSD Class II increment of 9 micrograms per cubic meter. However, this is only an EPA proposal and as such, does not go into a State Implementation Plan until after EPA adopts the proposed standard in rule. DENR has already explained how Hyperion is required to meet PM2.5 requirements under the PSD air quality permit program in Comment #38. Hyperion followed these requirements and satisfied the requirements for PM2.5.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.7 Additional Impacts

40. EPA alleges the statement, "based on the fact that land use in the vicinity of the proposed project is predominantly agricultural, the analysis focused on assessing impacts to agricultural crops grown near the proposed project site", was subjective and not supported. In addition, EPA states Hyperion is approximately 10 miles from the Ponca State Park in Nebraska and the Oak Grove State Park and Sioux County Parks in Iowa, which should be within the envelope of the soil and vegetation analysis. EPA recommends a soil and vegetation baseline should be established and it should be determined if the impacts from Hyperion would pose a threat of significant deterioration to commercial or recreational value.

Response: EPA questioned if the predominant land use in the area is agricultural as represented in Hyperion's application and DENR's Statement of Basis. According to the South Dakota Department of Agriculture website, Union County has a total land area of 294,600 acres and in 2005, 276,588 acres (approximately 94%) in Union County is used as farmland.

EPA recommends a soil and vegetation analysis for the parks mentioned in Iowa and Nebraska even though the parks are beyond the impact area defined in EPA's rules. In 40 CFR §52.21(b)(15), the term baseline area defines the area in which a facility will have a significant impact. The term baseline area or impact area refers to a one microgram per cubic meter concentration based on the annual average emissions from the proposed facility. EPA acknowledges this in its 1990 draft New Source Review Workshop Manual (page C9). EPA notes that a significant impact is defined as a one microgram per cubic

meter footprint annual increase. As noted in the Appendix E of the application, the significant impact area for the Hyperion project is within two miles of the facility. In developing the inventory sources to use in the model, the initial estimate of the significant impact area was approximately six miles. To ensure the impact area is sufficiently covered, South Dakota considers the baseline areas by county and Hyperion's significant impact area does not exceed Union County. Therefore, DENR disagrees that a specific soil and vegetation analysis should be conducted for the parks noted in Iowa and Nebraska.

In addition, EPA does not mention what vegetation types would be more sensitive than those already analyzed by Hyperion. Hyperion's analysis includes impacts to soybeans and alfalfa as well as wheat, corn, oats, barley, sorghum, and apples. EPA identifies soybeans and alfalfa as sensitive vegetative species in the 1990 draft New Source Review Workshop Manual (page D.5). In addition, EPA's 1990 draft New Source Review Workshop Manual (page D.5) states for most types of soils and vegetation, ambient concentrations below the secondary National Ambient Air Quality Standards will not result in harmful effects. Based on the dispersion modeling, Hyperion's impacts are well below the secondary National Ambient Air Quality Standards and Hyperion's greatest impacts occur within a few kilometers of its fence line and concentrations decrease rapidly from there.

EPA states the analysis should establish soil and vegetative baselines but it is unclear under what state and federal authority is required. In accordance with 40 CFR §52.21(o)(1), the federal regulations simply require an analysis of impacts that would occur from the associated emission increases. Hyperion did compare the modeled concentrations of gaseous pollutants and the estimated 100 year increases of various trace metals to levels of concern published in the applicable literature, including EPA's Screening Values, foreign guidelines, US Department of Energy publications, and other scientific literature. As illustrated in Tables 4-1 and 4-2 of Appendix F to Hyperion's permit application, all values were below the screening values in the literature.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

41. EPA states that Hyperion's application only includes residential population estimates and fails to provide an analysis of the air quality impacts projected for the area as a result of the growth. EPA recommends that DENR request this additional information and include it in the record and if appropriate, the draft PSD air quality permit.

Response: In 40 CFR §52.21(o)(2), it provides for an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial and other growth associated with the source. Hyperion's application covers this in Chapter 6 and Appendix G of the application. Chapter 6 identifies the increase in emissions Hyperion projects due to commercial and residential growth, such as vehicular traffic and other area

sources. The application discusses the potential for industrial growth starting in paragraph 2 of page 137 and on page 139 it states "For the purposes of this growth impacts analysis, RTP has used the National Emissions Inventory data available on the U.S. EPA website to characterize the current emissions inventory for the affected region. In conjunction with this inventory, RTP has made conservative assumptions regarding the impacts of residential and commercial growth associated with the HEC in order to predict the increases in air pollutant emissions." The area source inventory includes industrial fuel combustion.

Appendix G identifies the process to determine the population increase due to both Hyperion (1,249 jobs) and that generated from the increase in commercial, residential, and industrial sectors (14,147 jobs). Appendix G goes on to discuss the total direct, indirect, and induced population growth in the region (31,954) and the associated increases in air emissions from transportation, industrial, and miscellaneous sources. Therefore, Hyperion's analysis did take into account the impact projected for the area as a result of general commercial, residential, industrial and other growth associated with the proposed project.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.8 Visibility

42. Jenner & Block states in order to properly determine visibility impacts of Hyperion's emissions, secondary particulate formation from physical-chemical atmospheric transport and transformation phenomena must be considered and Hyperion's visibility analysis did not consider any physical-chemical secondary particle formation either on downwind ambient concentrations or on visibility.

Response: The PM10 BACT emission limits, in pounds per hour, used in the modeling analysis both for downwind ambient concentrations and visibility are established in Chapter 4.0 of the draft PSD air quality permit as both filterable and condensible particulate emission rates. Therefore, condensible particulate was included in the modeling analysis.

The VISCREEN model requires PM10 and nitrogen oxide BACT emission rate inputs, which is what Hyperion used in its visibility analysis. As stated above, condensible particulate was included in the analysis. The VISCREEN model does not require sulfur dioxide, ammonia, hydrogen chloride, or sulfuric acid mist emission rates.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

43. Jenner & Block believes Hyperion used an obsolete PLUVUE II model in its analysis of plume blight impacts.

Response: It appears Jenner & Block believes PLUVUE II is obsolete because it is a Gaussian plume dispersion model just like the ISC3 model that was replaced by AERMOD. However, AERMOD also uses Gaussian plume dispersion. PLUVUE II is referred to in section 6.2.1.d of Appendix W as a refined model for calculating the potential impacts of an emissions plume. Furthermore, the National Park Service submitted comments to DENR regarding the PLUVUE II analysis performed by Hyperion, which indicates they believe PLUVUE II is the acceptable model for this application. DENR believes the PLUVUE II model is the correct model.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

44. Jenner & Block believes Hyperion's VISCREEN analysis assumed no sulfates and omitted sulfur dioxide emissions which severely underestimates visibility impacts and did not use emission inputs that represent worst days as required by the VISCREEN model. The PM10 emission rate of 237 pounds per hour equates to 1,038 tons per year but the annual emission rate for the facility is 1,046 tons per year. In addition, the National Park Service also believes that the sulfuric acid mist emitted by Hyperion should be included in either the VISCREEN or PLUVUE modeling analysis because sulfuric acid mist is a surrogate for primary sulfate emissions.

Response: Jenner & Block and the National Park Service question the visibility analysis because primary sulfate emission rates were not inputted into the model. The VISCREEN analysis conducted by Hyperion was a Level 1 screening analysis. According to the VISCREEN user guide (Page 23 of the October 1992 version), "SO₂ emissions are not required as input to VISCREEN because over the short distances (< 200 km) and stable plume transport conditions typical of plume visual impact screening, secondary sulfate is not formed to a significant degree in plumes..... For almost every emission source, the emission rates of the last three species (primary NO₂, soot, and sulfate) can be assumed to be zero. Therefore you need only input the total particulates and NO_x emission rates (the first two categories of emissions required by VISCREEN)."

The PLUVUE II model requires emissions of particulate, sulfur dioxide, and nitrogen oxide as inputs into the model. DENR conducted a search of modeling guidance and the internet and was not able to find any information that supported the National Park Services comment that sulfuric acid mist should be included in the PLUVUE II analysis. The *User's Manual for the Plume Visibility Model (PLUVUE II) (Revised)* also does not include any reference to sulfuric acid mist or primary sulfate emissions as an input parameter listed on page 34 in the Input Data section.

Jenner & Block also questions the PM10 emission rate used in the model. It appears Jenner & Block is referring to the version of VISCREEN modeling submitted with Hyperion's original application, dated December 2007. This version of the VISCREEN modeling did use a particulate emission rate of 237.0 pounds per hour. However, Hyperion's modeling addendum submitted in May 2008 included updated VISCREEN analysis that used a particulate emission rate of 249.0 pounds per hour which is equivalent to 1,090 tons per year.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

45. Jenner & Block believes Hyperion should use the CALPUFF model to analyze the visibility impacts on the Class II National Parks evaluated by Hyperion. In addition, the National Park Service recommends DENR require CALPUFF modeling for parks greater than 50 kilometers since the VISCREEN model range is only 50 kilometers. The National Park Service believes it is misleading to report in the Statement of Basis that there is no visibility impact in the areas beyond 50 kilometers when relying on a model that is not recommended for those distances.

Response: Jenner & Block questions the applicability of VISCREEN to analyze beyond 50 kilometers because of long transport times of the plume and also questions the use of stable conditions and a wind speed of 1.0 meter per second. The National Park Service stated the VISCREEN model is not recommended to analyze beyond 50 kilometers based on "Appendix B of Appendix W; EPA Guideline on Air Quality Models". DENR reviewed the EPA Guideline on Air Quality Models in Appendix W to 40 CFR Part 51, however there is no Appendix B in the current version. There is an Appendix A to Appendix W, titled Summaries of Preferred Air Quality Models, which describes CALPUFF as appropriate for long-range transport (distances of 50 to several hundred kilometers). However, DENR could not find anything in Appendix A that discussed the applicability of VISCREEN. Section 6.2.3.b of Appendix W does recommend CALPUFF for use in obtaining refined estimates of impact to Class I areas greater than 50 kilometers from the source if long range transport is determined to be important.

The VISCREEN analysis conducted by Hyperion was a Level 1 screening analysis. Therefore, the stability class and wind speed used are the default values in a Level 1 analysis. Page 48 of the VISCREEN User Guide states "For the Level-2_screening analysis, we assume it is unlikely that steady-state plume conditions will persist for more than 12 hours. Thus, if a transit time of more than 12 hours is required to transport a plume parcel from the emissions source to a Class I area for a given dispersion condition, we assume that plume material is more dispersed than a standard Gaussian plume model would predict. This enhanced dilution would result from daytime convective mixing and wind direction and speed changes." Additionally Page C-2 of the VISCREEN user guide shows an example of application of Level 1 screening analysis for a source 70 kilometers away, which is greater than 50 kilometers.

DENR believes that it is appropriate to use these meteorological conditions (stable with wind speeds of 1 meter per second) for a Level 1 screening analysis and application of these assumptions will produce overly conservative results. The purpose of a screening analysis is to make conservative assumptions in order to rule out the possibility of impacts in the worst case. Although unrealistic to expect stable conditions and wind speeds of 1 meter per second for more than 12 hours, the predicted impacts will be greater using these assumptions. DENR believes this overly conservative approach is appropriate for the purposes of a screening analysis. DENR believes Hyperion's VISCREEN Level I screening analysis conservatively demonstrates that long range transport will not affect visibility at these Class II areas and a CALPUFF analysis is therefore not warranted.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

46. The National Park Service identified several modeling methodologies that they believe do not follow EPA PLUVUE guidelines in Appendix W or the Federal Land Manager's natural background conditions recommended in the FLM's Air Quality Related Values Work Group (FLAG) report in the PLUVUE analyses.

Response: The above comment cites Appendix W as the source of guidance listed in the comment relating to PLUVUE II, however, DENR was not able to find the listed recommendations in the current version of Appendix W or in the *User's Manual for the Plume Visibility Model (PLUVUE II)*. Refined visibility analysis are typically performed for sources with potential impacts on Class I areas (40 CFR §52.21(p)). Based on a review of the visibility modeling and the National Park Service not requiring a Class I analysis for the proposed source, DENR believes the submitted PLUVUE II modeling fulfills the requirements under 40 CFR §52.21(o)(1) and will not require the applicant to rerun the model.

The National Park Service questions the source of the visual range used by Hyperion and states that the modeling should be based on the visual range corresponding to natural conditions in the Badlands National Park or Hercules Glade, which are Class I areas over 400 kilometers from Hyperion's proposed site. As stated on page 22 in Appendix E to Hyperion's application the, visual background range used in the visibility modeling (59.8 kilometers) was calculated by PLUVUE II based on background sulfate and nitrate concentrations in the area. The natural conditions listed by the National Park Service are recommended for a Class I analysis. EPA techniques for plume visual impact screening analyses recommend the use of real current average annual visibility conditions. Data for western Class I areas in *Air Quality* by Thad Godish indicates that visible ranges corresponding to "natural conditions" are up to four times as far as actual average annual visual ranges.

DENR agrees with the visual ranges used by Hyperion in the visibility analysis and does not recommend any changes to the draft PSD air quality permit as a result of this comment.

47. The National Park Service believes if an observer is looking into the sky, the site paths through the plume center would show plume perceptibility (delta E) values as high as 4.758 which is well in excess of the Federal Land Managers threshold of 1.0. In addition, the National Park Service stated the national background conditions recommended by the Federal Land Managers were not used and if used, it is expected the predicted near-field impacts would be much greater.

Response: The National Park Service questions Hyperion's limiting the line of site to ground level in its PLUVUE II modeling analysis. As explained on page 25 of Appendix E of the application, the areas of study are not Class I areas and are not designated with terrain features or integral vistas; therefore, only horizontal views with a clear sky as background were evaluated. The National Park Service references Federal Land Manager thresholds for Class I areas, however the analysis conducted did not include any Class I areas because the National Park Service notified DENR via email on July 23, 2008, that the National Park Service was not requiring a Class I analysis for the Hyperion project, and therefore it does not apply.

In accordance with 40 CFR §52.21(o)(1), sources applying for PSD air quality permits are required to provide an analysis of the impairment to visibility that would occur as a result of the source. DENR believes Hyperion's visibility analysis fulfills that requirement. DENR disagrees with the National Park Services' proposed methodology to use a Class I analysis for a Class II park.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

3.9 Class I Areas

48. Jenner & Block recommends a modeling analysis for Class I areas be required for the Badlands, Wind Cave and Theodore Roosevelt National Parks. Jenner & Block also recommends DENR include a CMAQ/CAMx modeling analysis of potential air quality and visibility impacts on Class I areas and require Hyperion to provide a soils and vegetation analysis on the impacts of ozone on sensitive crops and plans.

Response: The recommended model for analyzing a facility's impact to a Class I area is CALPUFF. The Interagency Workgroup on Air Quality Modeling (EPA-454/R-98-019 page 18) notes that CALPUFF is valid at 200 kilometers or less. In addition, the guideline notes the model may overestimate the air quality concentration by 3 to 4 times at distances greater than 300 kilometers. Besides the recommended model not being valid farther than 300 kilometers, the National Park Service notified DENR via email on

July 23, 2008, that the National Park Service was not requesting a Class I analysis for the Hyperion project.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

4.0 Flare Operations

49. Jenner & Block believes the stack gas velocity for the IGCC gasification flare stack that Hyperion used in the modeling analysis is not appropriate and underestimates the ambient air impacts through overestimation of the plume rise from the gasification flare. Jenner & Block noted the flare tip velocity used in model does not meet the flare design requirements in 40 CFR 60.18(c)(3) and (4).

Response: Currently flares can be modeled in AERMOD different ways. The flare can be modeled: a) as a standard point source (no modified stack parameters); b) as a point source (with modified stack parameters); and c) as a flare (or pseudo-point source). Hyperion chose to model the gasification flare as a standard point source. For option b, which appears to be what Jenner & Block chose, flare sources are treated in a similar way to point sources, except the thermal effects of the flame with its lift and expansion of the plume require an effective stack height and effective stack diameter to be calculated. Hyperion modeled the flare emissions in accordance with the procedures required in the AERMOD model. The draft PSD air quality permit requires the flare tip velocity to meet the requirements in 40 CFR 60.18.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

50. Jenner & Block believes the short term limits are underestimated based on a calculation provided in the comment of an hourly emission rate of 20 pounds per hour based on the *peak short-term* flow rate of off spec syngas equating to 1,500 million Btus per hour.

Response: This *peak short-term* heat input rate refers to conditions that could only occur for a matter of a few minutes as explained in an August 12, 2008, email from Hyperion to DENR on the IGCC flare (20080812 IGCC Flare Email.pdf). The application in Appendix C identified the maximum *hourly* heat input rate. Therefore, the 15.729 pounds per hour emission rate used in the modeling is in fact the maximum hourly emission rate for the unit and correct emission rate to be used in the modeling analysis.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

51. A group of individuals requested "upsets" of the refinery flares should be included in the recovery and monitoring systems.

Response: Chapter 12.0 of the draft PSD air quality permit does not allow flaring during normal operation or during routine upsets caused by startup and shutdown of the refinery processes. The only time the refinery flares may be operated is during a malfunction and only if Hyperion follows the flare minimization plan required in permit condition 12.3. As defined in permit condition 12.1, a malfunction is any sudden and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner of the refinery processes. Hyperion is required after a malfunction to conduct a cause analysis to determine what caused the malfunction and flaring event and what corrective actions are available to keep the malfunction from happening again in the future to minimize flaring. In addition, Hyperion is required to inform DENR of the flare event at three different intervals. Hyperion is required to inform DENR within 15 minutes after a flare event happens and submit a summary of the flare event within 24 hours after the flare event has completed in accordance with permit condition 12.4, and submit the cause analysis report within 45 days after the flare event has completed in accordance with permit condition 12.5.

DENR believes trying to design a system to include all possible scenarios of an "upset" is not reasonable. As an alternative, DENR required a flare minimization plan, which uses a root cause analysis to minimize upsets (malfunctions) and does not allow flaring during normal operations and routine upsets such as startup and shutdown.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

52. Plains Justice believes Hyperion's analysis of the refinery flares lacks a basic characterization of the emissions to be expected during a flaring event. Plains Justice claims startup, shutdown and malfunction events are considered part of normal operation for a facility like Hyperion. Without the emissions from the normal operation of the flare, Plains Justice states the modeling analysis is inaccurate and does not protect the National Ambient Air Quality Standards. In addition, Jenner & Block and some individuals who commented were concerned Hyperion did not include flare emissions during startup, shutdown, or malfunctions in the modeling analysis.

Response: DENR disagrees normal operation includes malfunctions. As noted in 40 CFR Part 51, Appendix W, the ambient air quality analysis (modeling) considers the emissions during normal operations. This federal regulation notes in a footnote that malfunctions are not considered normal operations and should not be included in determining allowable emissions. Therefore, Hyperion is not required under federal regulations and DENR did not require the modeling analysis to include air emissions during a malfunction.

The emissions from the refinery flares Hyperion used in the modeling analysis included the emissions from the flares due to the pilot emissions used to maintain the flare in case of a malfunction. The emissions from the refinery flares due to upsets caused by startup and shutdown were not included because those flaring events are not allowed by the draft PSD air quality permit.

However, the emissions from the IGCC flares Hyperion used in the modeling analysis included the emissions for the flares during startup and shutdown of the IGCC process. The emissions for the IGCC flare were based on the EPA's emission factors in AP-42 for Industrial Flares.

In summary, the pilot emissions from the refinery flares and startup and shutdown emission from the IGCC flares were used in the modeling analysis to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

53. Plains Justice states the refinery flares emit chemicals with known health impacts and must be limited with emission limitations in the draft PSD air quality permit. Plains Justice does not believe a BACT analysis was conducted for the refinery or IGCC flares. Plains Justice contends the flare minimization plans in permit condition 12.3 and 13.3 do not satisfy the requirements of BACT because the plan is created and can be changed at a later date without public input and the emission control or emission limits in the plans will not be federally enforceable. Jenner & Block states the Flare Minimization plan does not provide sufficient detail.

Response: The BACT requirements for the refinery flares are all of the requirements listed in Chapter 12.0 of the draft PSD air quality permit and not just permit condition 12.3. Permit condition 12.1 does not allow the flaring of emissions caused by startup and shutdown of refinery processes. Flaring is only allowed from the refinery processes during a malfunction, which is an unforeseen and unavoidable failure of the a process within the refinery. Permit condition 12.2 requires the flares to meet the design and operational requirements in 40 CFR §60.18, which includes no visible emissions, net heating value requirement and an exit velocity requirement. Permit condition 12.3 requires a flare minimization plan and specifies the requirements of the plan. Permit condition 12.4 requires the recordkeeping and reporting of any flaring event that occurs due to a malfunction. Permit condition 12.5 requires a root cause analysis of the flaring event to determine corrective action so the malfunction will not happen again in the future.

DENR believes the public has two opportunities to provide input on the flare minimization plan. The first opportunity is now by providing input on all of the conditions in the draft PSD air quality permit, to include the flare minimization plan. The

second opportunity occurs once DENR receives the flare minimization plan because DENR's records are open to the public for review.

The BACT requirements for the IGCC flares are all of the requirements listed in Chapter 13.0 of the draft PSD air quality permit and not just permit condition 13.3. Permit condition 13.1 allows flaring of emissions caused by startup, shutdown, and malfunctions of the IGCC process. Permit condition 13.2 requires the flares to meet the design and operational requirements in 40 CFR §60.18, which includes no visible emissions, net heating value requirement and an exit velocity requirement. Permit condition 13.3 requires a flare minimization plan and specifies the requirements of the plan. Again DENR believes the public has at least two opportunities to provide input on the IGCC flare minimization plan as outlined above.

Hyperion's BACT analysis for the flares in the application and DENR's review of the flare BACT analysis in the Statement of Basis (section 7.1) identify the reasons why DENR established the flare minimization plans for the refinery process and IGCC operations as BACT. DENR believes the refinery flare minimization plan and IGCC flare minimization plans are enforceable.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

54. EPA recommends the following for the flares:

- Specific BACT emission limits for sulfur dioxide, carbon monoxide, nitrogen oxide, and particulate matter and standards for demonstrating compliance in the draft PSD air quality permit should be identified. As an example, EPA specified the visible observations on the refinery and IGCC flares should be conducted using Method 22 instead of Method 9 and the permit limit should be no visible emissions;
- EPA requests a minimum threshold for the higher (gross) heating value of the gas flow to each flare in addition to determining and recording such values as required by permit condition 12.4(6) in the draft PSD air quality permit;
- EPA specified the maximum exit velocity that ensures minimum emissions during flaring should be established and such flows should be monitored and recorded to demonstrate compliance; and
- EPA requests annual limits as part of BACT for the flares.

Jenner & Block alleges Hyperion failed to show flare and atmospheric discharge pressure relief systems are subject to federally enforceable BACT emission limits or clearly determined a BACT emission limit for this operation is technologically or economically infeasible. In addition, Jenner & Block presumes a control efficiency of 98% for flares, states a proper "top-down" BACT analysis was not performed for flares; does not agree with allowing the flare minimization plans to be developed at a later date; and the flare minimization plan is not BACT.

Response: As defined in 40 CFR §52.21(b)(12), BACT means "an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act, which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis taking into account energy, environmental, and economic impacts and other costs, determines is achievable through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques, for control of such pollutant. In no event can the application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61. If it is determined that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such a standard is, to the degree possible, required to set forth the emissions reduction achievable by implementation of the design, equipment, work practice or operation, and is required to provide for compliance by means which achieve equivalent results."

As noted in Hyperion's application, the flare system, which includes such items as flare header, flare stack, flare tips or burners, purge gas systems, pilot gas systems, ignition systems, assist systems, and compressors is designed to capture the refinery gas from startups, shutdowns, and routine upsets, and recycled back through the refinery operations either through production units or as gas to be burned in equipment such as the process heaters. Therefore, the permit states refinery flares may only be used in the case of a malfunction and malfunction has been defined to mean the malfunction has to be an unforeseeable or unknown cause to occur.

There is no direct method such as a performance test to demonstrate compliance with a numerical limit for a flare. One of the requirements for conducting a performance test is to locate the probe a specific distance from a disturbance, such as a bend in the stack or the top of the stack. In the case of the flares, one is unable to meet this requirement. In addition, it is not recommended to place a probe into an open flame as that will not meet the requirements of the performance tests.

As noted in the application, Hyperion estimated the amount of emissions likely to occur from each flare. For the refinery flares, the emissions are generated from burning a gas in the pilot light of the flare have been estimated. The pilot light is required to make sure the flare is ready to be used. Hyperion proposed to develop a gas recovery system that collects refinery gases during upsets that generally occur during startup and shutdown and known equipment failures. Therefore, during these types of periods and which are commonly flared in other refineries, Hyperion is required by the draft PSD air quality permit to collect the gas and not use the refinery flares. There is still a possibility an unknown equipment failure may occur and for safety reasons the facility would need to

flare. DENR required in permit condition 12.1 the refinery flares could only be used during a malfunction and defined a malfunction as any sudden and unavoidable failure of air pollution control equipment, process equipment, or a refinery process to operate in a normal or usual manner. A failure caused entirely or in part by poor maintenance, careless operation, preventable equipment breakdown, or any other cause within the control of the owner or operator of the source is not a malfunction. Therefore, DENR has specified the only time the refinery flares may be used is due to an unforeseeable event.

In accordance with 40 CFR Part 51, Appendix W, it notes a malfunction which may result in excess emissions is not considered to be a normal operating condition and generally should not be considered in determining allowable emissions. Appendix W clarifies if the excess emissions are the result of poor maintenance, careless operation, or other preventable conditions, it may be necessary to determine source impacts from those operations. Therefore, determining the impacts from a malfunction that is due to unforeseeable cause should not be considered in determining impacts or in determining allowable emissions.

Since there is still a possibility a malfunction may occur and a refinery flare must be used, DENR required a work practice standard to make sure the emissions during these events are properly minimized. DENR disagrees with EPA and Jenner & Block in their comments that the draft PSD air quality permit does not specify the design specifications or emission limitations for the flare. As noted in the EPA's AP-42 emission factor document, flares may be 98 percent efficient depending on the heat rate of the gases to be burned and the velocity of the flares and proper combustion could be determined if no smoke from the flare was present. Permit condition 12.2 requires each flare to meet the design specifications in 40 CFR §60.18. In accordance with 40 CFR §60.18(c), flares are required to be designed with no visible emissions, operated with a flame present at all times, and operated with the heat content value requirement and maximum tip velocity or an exit and actual velocity requirement. The specifications for flares in 40 CFR §60.18 also contain the specified methods on how this design specification shall be determined.

EPA notes the compliance demonstration for no visible emissions should be based on 40 CFR Part 60, Appendix A, Method 22 instead of Method 9. In the method summary discussion of Method 22, it states the observer certification for Method 9 is not required. However, the observer should have knowledge regarding background contrast, ambient lighting, observer position, wind, and the presences of uncombined water on the visibility emissions. The training for this method is obtained from the lecture portion of the Method 9 certification course. By requiring Hyperion to conduct the visible emission evaluation in accordance with Method 9, DENR is making sure the observer will be certified to conduct Method 9 evaluations and has the proper knowledge as required by the Method 22.

To verify Hyperion will not flare during upsets generated during startup and shutdown of the refinery operations, permit condition 12.3 was included to require a refinery flare minimization plan. Jenner & Block note the permit delays the flare minimization plan until after the permit issuance. The PSD air quality permit is required to be obtained prior to the facility beginning construction to establish the control technology and emissions limits that will be required of the facility. Until these decisions are made, detailed designs of the facility are not available. Since the specific operations of the equipment are generally based on the manufacturer specifications, if the manufacturer specifications are not available because the specific equipment has not been purchased at the time of issuance of the permit, the detailed designs of the refinery flare minimization plan are not available.

In addition, if a refinery flaring event does occur, Hyperion is required in permit condition 12.4 and 12.5 to maintain specific recordkeeping and reporting requirements to identify the duration of the flaring event, an estimated amount of emissions that occurred during the flaring event, and an analysis of what caused the flaring event. DENR required the analysis if over 5,000 cubic feet of gas is flared. EPA notes the analysis should also be required if the flare emissions are greater than 500 pounds of sulfur dioxide produced in a 24-hour period, which is consistent with their refinery settlements. This threshold is required in 40 CFR §60.103a(b) under 40 CFR Part 60, Subpart Ja. Hyperion is required to meet all the applicable requirements in Subpart Ja as noted in permit condition 6.4. DENR required the 5,000 cubic feet of flared gas threshold to address all of the emissions generated during a flaring event, not just sulfur dioxide.

The information collected during a flaring event is required to be submitted to DENR by a specific timeline, all reports are required to be signed by a responsible official or duly authorized representative and all reports must contain a certification the report is true and accurate. Once the report is submitted to DENR, the report is available for the public to review. Even though the intention of the analysis is to verify a malfunction was the cause of the flaring event, the required report does not specify Hyperion must identify the cause was a malfunction. Therefore, DENR agrees with EPA that additional criteria should be included to verify the flaring event did occur during a malfunction and will revise permit condition 12.5 of the draft PSD air quality permit to require information to demonstrate a malfunction has occurred.

In regards to the IGCC flare, the same discussion above applies with a few exceptions. One of those exceptions is it is not technically feasible to collect and burn in a combustion device all of the gas generated during a startup or shutdown of the gasifier system. Therefore, the flaring during these periods is needed for safety reasons. Hyperion considered the number of hours it anticipated flaring would occur during these events and provided emission calculations for these periods. Besides the design requirements for the flare in 40 CFR §60.18 and the IGCC flare minimization plan, the application notes it will not flare gases that contain more than 40 parts per million by volume sulfur. This requirement limits the amount of sulfur dioxide that may be generated during a flaring event.

Even though Hyperion needs the ability to flare during startup or shutdown of the IGCC system, DENR does agree that Hyperion should be required to minimize the flaring due to malfunctions. Therefore, DENR will revise the draft PSD air quality permit by adding permit condition 13.5 which will require a root cause analysis for flaring that is caused by a malfunction.

DENR agrees the draft PSD air quality permit does not specify the flare minimization plan is required to be submitted to DENR and approved. DENR agrees the plan should be submitted and approved by DENR and revised permit conditions 12.3 and 13.1 in the draft PSD air quality permit accordingly.

DENR believes Hyperion should have the discretion to change the flare minimization plan as Hyperion becomes more familiar with the operations and will be able to optimize its procedures and maintenance. In addition, new technology or new computer software programs are likely to become available in the future. Therefore, Hyperion needs the ability to make these changes as soon as practicable. DENR does agree that any revision to the plan should be submitted and approved and will revise permit conditions 12.3 and 13.1 in the draft PSD air quality permit accordingly.

55. On page 73 of the draft PSD air quality permit, permit condition 13.1 requires flaring of gases from the refinery be completed in accordance with a flare minimization plan. Hyperion believes this requirement is redundant with permit condition 12.1, and appears to be the results of a transcription error by DENR. Hyperion recommends permit condition 13.1 be revised to refer to flaring of gases from the gasification system rather than gases from the refinery.

Response: Chapter 13.0 of the draft PSD air quality permit is the recommended flare minimization plan conditions for the IGGC flare. DENR agrees the reference to flaring should refer to the IGCC flare and not the refinery flares and will revise permit condition 13.1 of the draft PSD air quality permit appropriately.

56. On page 74 of the draft PSD air quality permit, paragraph 18(a) of permit condition 13.1 requires a periodic review of flaring that has occurred during planned major maintenance of the IGCC system, including flaring during associated startup events, and a periodic evaluation of the feasibility or performing these activities without flaring. Similarly, paragraph 18(b) of permit condition 13.1 requires a periodic review of flaring expected to occur "due to issues of gas quantity and quality" and a periodic evaluation of the feasibility of "reducing flaring through the recovery, treatment, and use of the gas or other means." The final paragraph of permit condition 13.1 requires the flare minimization plan be revised as necessary to ensure the plan complies with these requirements. Hyperion recommends these permit conditions be revised to clarify the flare events described in Table 5.2 of Hyperion's PSD permit application demonstrate there are no technically feasible control measures for eliminating or further reducing emissions from initial start, hot restart, warm restart, or cold restart events, and DENR's

BACT determination provides for occurrence of flaring during these events. Hyperion states it cannot be subjected to a requirement for arbitrary, future re-evaluation of BACT requirements after designing and constructing the gasification system.

Response: Flaring is allowed during the startup and shutdown (initial start, hot restart, warm restart, or cold restart events) of the gasifier system. Even though Hyperion needs the ability to flare during startup or shutdown of the IGCC system, DENR does agree Hyperion should be required to minimize the flaring due to malfunctions. Therefore, DENR will revise the draft PSD air quality permit by adding permit condition 13.5, which will require a root cause analysis for flaring that is caused by a malfunction and will remove the references to reevaluations of flaring events during startup and shutdown in permit condition 13.3 of the draft PSD air quality permit.

57. Chapter 13.0 of the draft PSD air quality permit does not include any restrictions on the sulfur content of off-specification syngas to be burned in the IGCC flares. As described in Section 4.13.2 of Hyperion's application, Hyperion committed to flaring only off-specification syngas that has been desulfurized to a sulfur concentration of 40 part per million by volume, based on an hourly average, beginning six months after startup of the IGCC power plant. Hyperion requests this commitment be reflected in the draft PSD air quality permit as an enforceable emission limit representing BACT for sulfur dioxide emission from the gasification flare.

Response: DENR agrees to include the limitation of flaring syngas that has a sulfur content less than 40 parts per million by volume in the IGCC flares and will revise permit condition 13.1 of the draft PSD air quality permit appropriately.

5.0 Process Heaters

58. On pages 41 and 42 of the draft PSD air quality permit, in Table 4-4, the volatile organic compound emission limit for each process heater is stated as 0.0015 pound per million Btu heat input. Hyperion indicates the limit in the permit is not achievable, is not limited in any other permit nationally, and recommends the limit be no more stringent than 0.005 pounds per million Btus heat input.

Response: DENR disagrees with Hyperion that the volatile organic compound emission limits are not limited in Louisiana's permit for Marathon Petroleum Company's refinery. Table IV of the permit lists the maximum allowable emission limits. This table lists a pound of volatile organic compound emission limit and a maximum capacity of the units. For the heaters, the emission rate in pounds per million Btus equates to 0.0015 pounds per million Btus. Table V of the permit identified BACT limits and notes that the volatile organic compound BACT limit for the heaters is 0.0015 pounds per million Btus. DENR does agree the permit does not appear to require testing to demonstrate compliance with the emission. However, since testing has not been conducted, the facilities have not proven this limit is achievable.

DENR disagrees with Hyperion that the volatile organic compound emission limits are not limited in Texas' Fina Oil & Chemical Company's permit. The permit contains an emission rate table that notes the maximum allowable emissions from each source. The table lists the pounds per hour limit for each source. The permit also limits the firing rate of each of the units. Using this pound per hour limit divided by the capacity of the unit equates to emission rates of 0.001 to 0.003 pounds per million Btus. In the technical review, the fuels listed to be burned are natural gas and off gases, also referred to as refinery gas. DENR does agree the permit does not appear to require testing to demonstrate compliance with the emission. However, since testing has not been conducted, the facilities have not proven this limit is achievable.

One of the cleanest fuels to burn is natural gas. DENR reviewed stack test data for new boilers burning natural gas in South Dakota to determine if the emission rate would likely be achieved if the heaters burned natural gas. In reviewing stack testing data in South Dakota for new boilers burning natural gas, the volatile organic compound as carbon emission rates in pounds per million Btus ranged from 0.0012 to 0.004 pounds per million Btus. It appears the 0.0015 pounds per million Btu limit while burning natural gas is not achievable.

In light of the submitted information, DENR agrees the BACT limit for volatile organic compounds for the process heaters should be 0.005 pounds per million Btus and will revised Table 4-4 of the draft PSD air quality permit appropriately.

59. On pages 44 and 45 of the draft PSD air quality permit, in Table 4-5, the carbon monoxide emission limit for each process heater is stated as 0.007 pounds per million Btu heat input. Hyperion states this limit in the permit is not achievable and should be revised to 0.01 pounds per million Btu heat input.

Response: As noted in the Statement of Basis, one of the permits DENR relied on to determine the carbon monoxide emission limit was the South Coast Air Quality Management District's permit for the Ceneco Refining Company. As noted in its public notice for the BACT determination, the South Coast Air Quality Management District notes "The basis for the CO BACT determinations is a 460 million Btu/hour refinery heater at TOSCO Refining Company with the same permit limits. The District issued the permit in 1995 and the heater has been operating since 1995. Compliance with the emission limits has been verified by source tests."

In November 2007, EPA Region IX proposed a PSD permit for the Bay West Refinery large process heaters (215 and 641 million Btus/hour) and small process heaters (35 and 47 million Btus/hour). The carbon monoxide emission limit for the large process heaters was 10 parts per million corrected to 3 percent oxygen. The carbon monoxide emission limit for the small process heaters was 50 parts per million corrected to 3 percent oxygen.

Using Equation 5-1 which converts the parts per million to micrograms per cubic foot and Equation 5-2 which is derived from 40 CFR Part 60, Appendix A, Method 19 to convert pounds per cubic foot to pounds per million Btu, the carbon monoxide 10 parts per million at 3 percent oxygen emission rate would be equivalent to 0.007 pounds per million Btus. The carbon monoxide 50 parts per million at 3 percent oxygen emission rate would be equivalent to 0.037 pounds per million Btus.

Equation 5-1

$$(Concentration) = \frac{(ppm)x(MW)x(6.24x10^{-11})}{(0.02404)}$$

Where:

- Concentration = pounds per cubic foot on a dry basis;
- ppm = parts per million; and
- MW = molecular weight of the compound (28 for carbon monoxide).

Equation 5-2

Equation 3-2
$$E = (Cd)x(Fd)x\left(\frac{20.9}{20.9 - O2}\right)$$

- E = emission rate in pound per million Btu;
- Cd = pollutant concentration in pounds per cubic foot on a dry basis;
- Fd = Fuel Type Factor -8,710 dry standard cubic foot per million Btu; and
- O2 = percent oxygen.

DENR agrees that for the small process heaters (65 and 67 million Btus) the carbon monoxide BACT limit is the proposed 0.01 pounds per million Btus and will revise the limits for those heaters in permit condition 4.5 of the draft PSD air quality permit. However, for the large process heaters, DENR still considers BACT as 0.007 pounds per million Btu (equivalent to 10 parts per million by volume) and does not recommend any changes to the draft PSD air quality permit for those heaters.

60. EPA stated the methodology DENR is using to determine compliance with the nitrogen oxide BACT emissions limit for the petroleum refinery process heaters during startup, shutdown and malfunctions of a 365-day rolling average should not be considered BACT. EPA identifies Arizona's Clean Fuels Yuma Refinery's PSD air quality permit issued on September 18, 2006, as not including such an averaging time. EPA recommends DENR require Hyperion to meet the nitrogen oxide BACT limit at all times using the three hour rolling average or develop a separate BACT limit for startup and shutdown and require Hyperion to track these periods for determining compliance.

Response: DENR's review of the BACT analysis submitted by Hyperion did not just consist of looking at other PSD air quality permits, but also reviewing the other states' technical reviews. A technical review like our Statement of Basis helps identify the

thought process in developing the permit condition and compliance demonstrations. During DENR's review, it found Arizona's technical document makes a reference to the nitrogen oxide BACT emission limit excluding startup, shutdown, and malfunctions. For example, on page 315 and 316 of the technical document, the document discusses one of the reasons the New Source Performance Standard for the steam boilers was being included, even though the emission limit itself was less stringent, was because the New Source Performance Standard's nitrogen oxide emission limits includes periods of startup, shutdown, and malfunctions. Another example is actually in the permit itself. On page 22 of the PSD air quality permit for Arizona's Clean Fuels Yuma Refinery, it notes the nitrogen oxide emission limits may become more stringent depending on a statistical analysis of the continuous emission monitoring data. However, the monitoring data collected during startup, shutdown, and malfunctions was not to be included in that analysis. Both the technical document and PSD air quality permit lead DENR to believe periods of startup, shutdown, and malfunctions were not included by Arizona in the nitrogen oxide BACT emission limit for the process heaters.

The concept of emissions being higher during startup, shutdown, and malfunctions than other operations is dependent upon effectiveness of the applicable control equipment and the unit. The emissions on a pound per million Btus or a pound per ton basis are likely to be higher during startup, shutdown, and/or malfunctions while emissions on a pounds per hour basis are likely to be less. For example, consider one of the small process heaters controlled by a low nitrogen oxide burner with a maximum design rate of 65 million Btus per hour. The nitrogen oxide BACT limit for the process heater is 0.025 pounds per million Btus, which equates to an hourly emission limit of 1.6 pounds per hour at maximum capacity. If the process heaters have an uncontrolled emission rate of 0.1 pounds per million Btus (based on EPA's AP-42 documents for burning natural gas without a low nitrogen oxide burner), the process heaters uncontrolled nitrogen oxide emissions would exceed the pounds per million Btu emission limit immediately while the pounds per hour emission limit would not be exceeded until the process rate reached approximately 16 million Btus per hour or approximately 25% of the operating capacity of the process heater.

DENR reviewed Hyperion's BACT analysis and determined the nitrogen oxide emission limit for the process heaters during startup, shutdown, and malfunctions should be the same as normal operations but that the determination of compliance would be on a 365-day rolling average.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

61. EPA notes one PSD air quality permit (Ceneco Refining Company) sets precedence for requiring a selective catalytic reduction system for nitrogen oxide emission controls for process heaters with a high heating value as small as 50 million Btus per hour.

Response: DENR checked on the status of Ceneco Refining Company's operation and determined the selective catalytic reduction system was never installed and operated. As noted in DENR's Statement of Basis (page 88), Ceneco Refining Company went through bankruptcy and did not begin operations again as a refinery. DENR does not believe a PSD air quality permit for a facility that went bankrupt sets precedence or demonstrates that the selective catalytic reduction system is a cost effective method.

As noted in the application's cost analysis for the selective catalytic reduction system on the smaller process heaters, the selective catalytic reduction system has the potential to increase PM2.5 emissions by approximately 1.8 tons per year. In the May 16, 2008, federal register notice for the final rule for the new source review program (page 28339), the suggested offset ratio for nitrogen oxide to PM2.5 was 100 to 1. EPA indicates in its notice to receive an air quality benefit a reduction of 100 tons of nitrogen oxide emissions would offset an increase of 1 ton of PM2.5 emissions. If the selective catalytic reduction system is required for the ten small process heaters, this would decrease the nitrogen oxide emissions by approximately 55 tons per year but potential increase the PM2.5 emissions by 18 tons per year. This generates a ratio of nitrogen oxide to PM2.5 of 3 to 1. Therefore, DENR believes the increase in PM2.5 emissions to decrease the nitrogen oxide emissions by requiring a selective catalytic reduction system on the small process heaters is not environmentally justified.

Once DENR reviewed all of the factors involved, DENR agreed that a high heating value of 66.9 million Btus per hour was an acceptable level for separating which process heaters would install a selective catalytic reduction system and which ones would install a ultra low NOx burner. DENR discusses its response to the cost analysis in Comment #15 of this document.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

6.0 Wastewater Treatment Plant

62. Hyperion indicated on page 21 of the draft PSD air quality permit, permit condition 3.6(6) requires Hyperion to collect and analyze samples of wastewater entering the oil/water separators on an hourly basis, analyze each sample for benzene concentration, and calculate a flow-weighted average concentration for each day based on an average of the 24 samples collected. Hyperion believes this frequency is excessive and unwarranted and recommended an analysis be based on a monthly monitoring schedule as required under 40 CFR §61.354(b)(1).

In addition, Hyperion indicated on page 23 of the draft PSD air quality permit, permit condition 3.8(12) requires each quarterly report submitted by Hyperion indicate the flow-weighted average benzene concentration for each day in the reporting period based on a 365-day rolling average. Hyperion recommends this condition be clarified to indicate it

is referring to the benzene concentration of the combined wastewater streams entering each oil/water separator. In addition, Hyperion believes this frequency is excessive and unwarranted; rather than daily calculations, only monthly calculations of flow-weighted annual average benzene concentration should be required.

Response: DENR agrees 40 CFR §61.354(b)(1) does require just monthly monitoring of the wastewater. DENR reviewed the surface water quality sampling frequency for other industries and generally the most frequent wastewater monitoring was based on one sample per week with the potential option of going monthly depending on historical data. Hyperion is proposing a new facility and does not have any historical data to review. Therefore, DENR recommends monitoring be based on a weekly sample with the option that frequency may go to once per month as noted in 40 CFR Part 61, Subpart FF. Permit condition 3.6 of the draft PDS air quality permit will be revised to indicate that weekly or a monthly sample needs to be logged and that an annual average shall be calculated. Permit condition 3.8 of the draft PSD air quality permit will be revised to indicate that the annual average for each week or month shall be submitted in the quarterly report. Permit condition 15.2 of the draft PSD air quality permit will be revised so the benzene limit is based on an annual average, will be based on the weekly or monthly samples and has to follow the requirements in 40 CFR Part 61 Subpart FF.

63. On page 26 of the draft PSD air quality permit, in Table 4-1, the PM10 emission limit for the wastewater treatment plant catalytic oxidizer is listed as 0.01 pounds per hour. Hyperion believes this limit reflects a calculation error and recommends the limit should be 0.05 pounds per hour. In addition, Hyperion indicates the description in the table describes the control device as a thermal oxidizer; but it should be described as a catalytic oxidizer.

Response: DENR reviewed the application, Statement of Basis and its calculations and agrees there was a calculation error. The original calculation was based on 0.08 million Btus per hour heat input instead of the correct operation of 5 million Btus per hour heat input which was identified in the application and used in the model to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. The correct calculation to derive the emission limit is based on Equation 6-1.

Equation 6-1
$$\left(\frac{0.0075 \ pounds}{MMbtu}\right) \times \left(\frac{5 \ MMBtus}{hour}\right) = \left(\frac{0.04 \ pounds}{hour}\right)$$

DENR also agrees that the description in Table 4-1 of the draft PSD air quality permit should be a catalytic oxidizer instead of thermal oxidizer.

DENR agrees that the 0.01 pounds per hour BACT emission limit is incorrect. However, based on Equation 6-1, the correct BACT emission limit should be 0.04 pounds per hour and not 0.05 as recommended by Hyperion. DENR will correct the BACT emission limit

in Table 4-1 in the draft PSD air quality permit. In addition, the maximum heat input for the unit in Table 1-1 was corrected to 5 million Btus per hour.

64. One individual stated "Entry 45a is not clear" in Table 4-2.

Response: Table 4-2 identifies the sulfur dioxide BACT emission limit for the wastewater treatment plant thermal oxidizer. It specifies the air emission limit as 25 parts per million by volume determined as hydrogen sulfide in the refinery gas. Essentially the sulfur dioxide emissions from this process results from the refinery gas used to run the thermal oxidizer. By limiting the amount of hydrogen sulfide in the refinery gas, one limits the amount of sulfur dioxide emitted from the thermal oxidizer.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

65. On page 32 of the draft PSD air quality permit, in Table 4-2, the sulfur dioxide limit for the wastewater treatment plant catalytic oxidizer is a hydrogen sulfide concentration of 25 parts per million by volume in refinery gas. Hyperion believes the permit condition should be revised to clarify that the vapors from the wastewater treatment plant are not "refinery gas". In addition, this permit term describes the control device as a thermal oxidizer. Hyperion recommended the device should be described as a catalytic oxidizer.

Response: The term "refinery gas" does not refer to the gas that the wastewater treatment plant produces. The term "refinery gas" references one of the two auxiliary fuels that were requested to be burned by the catalytic oxidizer. The other auxiliary fuel is listed as natural gas. DENR will revise the description of the control device in Table 4-2 and note in permit condition 1.1 the types of gases that will be burned by the control device.

66. On pages 42 and 43 of the draft PSD air quality permit, in Table 4-4, the volatile organic compound emission limit for the wastewater treatment plant's catalytic oxidizer is listed as either 98 percent destruction efficiency or 20 parts per million by weight, whichever is less stringent. Hyperion believes the concentration limit should be expressed as 20 parts per million by volume.

Response: DENR reviewed the application and Statement of Basis and agrees the concentration limit should be expressed in parts per million by volume. The concentration in parts per million by volume was used in the modeling to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. DENR will revise Table 4-4 of the draft PSD air quality permit appropriately.

67. EPA recommended DENR revise Table 1-1 of the draft PSD air quality permit to list a thermal oxidizer as the appropriate control for the wastewater treatment plant instead of the catalytic oxidizer and selective catalytic reduction system currently listed. EPA states

that the catalytic oxidizer and selective catalytic reduction system is what Hyperion proposed and DENR disagreed in the Statement of Basis. EPA also recommended the heat input rate for the control device be corrected in Table 1-1. In addition, EPA recommends the nitrogen oxide BACT emission limit should be expressed as pounds per million Btu and the hourly emission rate should be based on the thermal oxidizer design capacity.

Response: DENR reviewed the application and its Statement of Basis and disagrees with EPA that the control should be a thermal oxidizer. DENR did not disagree in the Statement of Basis with Hyperion's proposal to consider a catalytic oxidizer and selective catalytic reductions system as BACT for the wastewater treatment plant. DENR did incorrectly interchange the two terms; but a catalytic oxidizer and selective catalytic reduction system were considered BACT as proposed by Hyperion. DENR's disagreement with Hyperion occurred on the emission limitation for the catalytic oxidizer. Hyperion referenced the emission limitation standards in 40 CFR §61.349, which allows for a 95% control efficiency for hydrocarbons. DENR considered the BACT limit should be 98% for volatile organic compounds, which would be the same as the benzene control efficiency requirement noted in 40 CFR §61.349.

In the wastewater treatment plant BACT analysis for nitrogen oxide, the generation of the nitrogen oxide emissions is due to the combustion of the auxiliary fuel and the gases from the wastewater treatment facility. Unlike normal combustion of the auxiliary fuel, the gases from the wastewater treatment facility contain nitrogen bearing gases such as ammonia. Therefore, the nitrogen oxide BACT limit for this unit takes this into account and basing a nitrogen oxide BACT limit on maximum heat input to the control device as EPA suggested would be inappropriate.

DENR incorrectly identified a thermal oxidizer as the control for the wastewater treatment plant and will revise the appropriate conditions throughout the draft PSD air quality permit to reflect that the control equipment is a catalytic oxidizer and selective catalytic reduction system. In reviewing the permit language, DENR recognized the heat input rate for the catalytic oxidizer was listed as 1.0 million Btus per hour and should be listed as 5.0 million Btus per hour. DENR will revise Table 1-1 o f the draft PSD air quality permit accordingly. DENR also noticed that in permit condition 15.4, that 40 CFR §61.349 was referenced incorrectly and will be corrected.

68. Jenner & Block states a BACT analysis was not conducted for the wastewater collection equipment for the IGCC power plant and the refinery.

Response: Hyperion's application provided an uncontrolled emission rate for volatile organic compounds for the wastewater treatment facility (API Separator, DAF Separator, and the Aeration Tanks) based on an EPA software program called Water9, which may be obtained from EPA's webpage at http://www.epa.gov/ttn/chief/efpac/efsoftware.html. The controlled emission rate calculations are provided in Appendix C of the application.

The BACT analysis for the drain events identified BACT as a closed vent system and dual carbon canister design standard as noted in 40 CFR §61.349. The emissions from this type of system are approximately zero tons per year and are considered negligible. This is evident in Hyperion's application that calculated process drains noted in Appendix C of the application. Since the BACT limitation is the dual canister, 40 CFR Part 61, Subpart FF, which is a requirement of permit condition 7.2 of the draft PSD air quality permit, requires the monitoring of the first canister to determine if there is any volatile organic compound leakage and to change the carbon media if leakage is monitored. Even if there is leakage from the first canister, the second canister captures that leakage.

DENR disagrees that a BACT analysis was not conducted for the refinery and IGCC wastewater system. DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

69. Jenner & Block states the application was incomplete and not approvable since Hyperion's BACT analysis did not address other regulated NSR pollutant emissions besides volatile organic compounds and nitrogen oxide from the wastewater treatment plant thermal oxidizers. Jenner & Block notes DENR's Statement of Basis considered the other pollutants. In either case, Jenner & Block claims Hyperion's and DENR's BACT analysis are still defective because: 1) there is no benzene, ethyl-benzene, toluene or Xylene emission rates for airborne toxicant determination; 2) the volatile organic compound BACT determination fails to conform to the "top-down" BACT determination method; 3) other control methods were not considered such as flameless thermal oxidation using ceramic honeycomb matrix bed, industrial biofilters, and use of process gas as combustion air in a heater or boiler; 4) the application did not address the effects of sulfur or metals on the planned catalytic thermal oxidizer design; and 5) the BACT analysis in the Statement of Basis for carbon monoxide was unsupported.

Response: DENR does not agree the process of evaluating an application should be stopped because additional information is needed to complete the review of the application. Depending on the complexity of the additional information, DENR will gather the information itself and document it in the Statement of Basis or require the applicant to provide the additional information during the review process. Once the information is obtained, it is evaluated and discussed in the Statement of Basis.

Jenner & Block state the BACT analysis was defective because there is no benzene, ethyl-benzene, toluene, or xylene emission rates provided for airborne toxicant determination. DENR discussed this in Comment #137 that hazardous air pollutants are not considered a regulated NSR pollutant. However, these pollutants are also considered a volatile organic compound and are addressed in the BACT analysis for volatile organic compound emissions.

Jenner & Block also state the BACT analysis was defective because the analysis did not conform to the "top-down" approach. DENR has already responded to a similar comment that addresses this issue in Comment #11.

Jenner & Block did not provide any documentation supporting the claim that the wastewater treatment facility prior to the thermal oxidizer will produce hydrogen sulfide emissions. DENR reviewed other BACT determinations for an oil refinery and /or IGCC facility and could not locate information that hydrogen sulfide emissions would be generated prior to the catalytic oxidizer. DENR did consider the additional environmental impact of a combustion fuel source and the wastewater gases in the catalytic oxidizer and determined that this would produce particulate matter, sulfur dioxide, nitrogen oxide, and carbon monoxide emissions and those emissions should be accounted for in the analysis.

In regards to the description of the control device, the control device is a catalytic oxidizer and selective catalytic reduction systems. Other comments brought this error to DENR's attention and DENR has agreed to revise the draft PSD air quality permit appropriately. Even though DENR has inadvertently used the term thermal oxidizer to describe the control device, the control device is not a thermal oxidizer. Catalytic oxidizer oxidation reaction occurs when the waste gas stream comes in contact with a catalyst bed. The nitrogen oxide emissions are generated through the oxidation of the waste gas stream that will contain nitrogen bearing compounds such as ammonia.

Hyperion conducted an extensive BACT analysis and DENR verified the BACT analysis in its review as outlined in the Statement of Basis. Except for revising the description of the control device, DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

70. Hyperion states on page 5 of the draft PSD air quality permit, the wastewater treatment plant aeration tanks (Unit #45C) are described as being equipped with internal floating roofs. Hyperion indicates this is inconsistent with the information provided in the permit application and is not a technically feasible measure for reducing volatile organic compound emissions from these tanks. Hyperion believes DENR meant to identify the wastewater treatment plant equalization tanks as being equipped with internal floating roof tanks.

Response: DENR reviewed the Statement of Basis and draft PSD air quality permit and determined this is a typographical error. Unit #45C should be described as the wastewater treatment plant equalization tanks will be equipped with internal floating roof tanks. DENR agrees with this requested change and revised Table 1-1 of the draft PSD air quality permit appropriately.

71. One individual believes the volatile organic compound BACT emission limit in Table 4-4 of the draft PSD air quality permit for Unit #45a is inappropriate and will allow

wastewater to be released with contamination levels much higher than 20 parts per million.

Response: It appears the individual is confusing the BACT volatile organic compound emission limit in Table 4-4 as a surface water quality limit for wastewater when in fact it is an air emission limit and does not establish any requirements for the wastewater. Water quality limits will be established in a separate water discharge permit. However, the volatile organic compound emissions volatilizing from the wastewater into the air are required to be collected and passed through a catalytic oxidizer to control volatile organic compound air emissions.

DENR does not recommend any changes to the draft PSD air quality permit based on this comment.

72. On page 84 of the draft PSD air quality permit, permit condition 15.2 restricts the flow-weighted average benzene concentration in the wastewater entering the oil/water separators to 10 parts per million by weight "determined on a 365-day rolling average." Hyperion recommends pursuant to 40 CFR §§61.343(c)(2) and 61.384(a)(i), the correct expression for this limit is "on a flow-weighted annual average basis."

Response: DENR provided a response to the frequency in Comment #62. Hyperion is applicable to several standards and where appropriate, DENR tries to maintain consistency between all of the regulations. DENR agrees the limit should be expressed as a "flow-weighted annual average basis" and will revise permit condition 15.2 of the draft PSD air quality permit appropriately.

7.0 Sulfur Recovery Plant

73. On page 26 of the draft PSD air quality permit, in Table 4-1, the PM10 BACT limit for each sulfur recovery plant thermal oxidizer is stated as 0.0055 pounds per long ton sulfur input. Hyperion believes these limits reflect a calculation error and are incorrect. Hyperion calculated the limit based on the application and believes the limit should be 0.13 pounds per long ton for PM10.

Response: DENR reviewed the application, Statement of Basis and its calculations and agrees there was a calculation error. The original calculation was based on 2,040 tons of sulfur per hour instead of the correct operation of 2,040 tons of sulfur per day. The correct calculation for PM10 to derive the emission limit is based on Equation 7-1.

Equation 7-1

$$\left(\frac{11.2 \ pounds}{hour}\right) \times \left(\frac{24 \ hours}{day}\right) \times \left(\frac{1 \ day}{2,040 \ tons \ _sulfur}\right) = \left(\frac{0.13 \ pounds}{tons \ _sulfur}\right)$$

The 11.2 pounds of PM10 per hour emission limit in Equation 7-1 was identified in the application and used in the model to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. DENR agrees with this requested change and revised Table 4-1 of the draft PSD air quality permit appropriately.

74. On page 32 of the draft PSD air quality permit, in Table 4-2, the sulfur dioxide emission limit for each of the sulfur recovery plant thermal oxidizers is stated as 0.056 pounds per long ton of sulfur input. Hyperion believes these limits reflect a calculation error and are incorrect. Hyperion calculated the limit based on the application and believes the limit should be 1.3 pounds per long ton for sulfur dioxide.

Response: DENR reviewed the application, Statement of Basis and its calculations and agrees there was a calculation error. The original calculation was based on 2,040 tons of sulfur per hour instead of the correct operation of 2,040 tons of sulfur per day. The correct calculation for sulfur dioxide to derive the emission limit is based on Equation 7-2

Equation 7-2

$$\left(\frac{114.2 \ pounds}{hour}\right) \times \left(\frac{24 \ hours}{day}\right) \times \left(\frac{1 \ day}{2,040 \ tons \ _sulfur}\right) = \left(\frac{1.3 \ pounds}{tons \ _sulfur}\right)$$

The sulfur dioxide emission limits in Equation 7-2 were identified in the application and used in the model to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. DENR agrees with this requested change and revised Table 4-2 of the draft PSD air quality permit appropriately.

75. On pages 49 and 50 of the draft PSD air quality permit, in Table 4-7, the hydrogen sulfide emission limits for each of the sulfur recovery plant thermal oxidizer are stated as 0.3 pounds per hour and 0.00015 pound per long ton of sulfur input. Hyperion believes the inclusion of the two separate limits is redundant and one of the two limits should be deleted. In addition, Hyperion believes the limit of 0.00015 pounds per long ton of sulfur reflects a calculation error and is incorrect and indicates the correct limit should be 0.004 pounds per long ton of sulfur input.

Response: DENR proposed two limits to verify the emissions will be minimized throughout the operational range of the systems and to limit the maximum emissions of hydrogen sulfide. Therefore, DENR disagrees with Hyperion the two limits are redundant.

DENR reviewed the application, Statement of Basis and its calculations and agrees there was a calculation error. The original calculation was based on 2,040 tons of sulfur per hour instead of the correct operation of 2,040 tons of sulfur per day. The correct calculation for hydrogen sulfide to derive the emission limit is based on Equation 7-3.

Equation 7-3

$$\left(\frac{0.3 \ pounds}{hour}\right) \times \left(\frac{24 \ hours}{day}\right) \times \left(\frac{1 \ day}{2,040 \ tons \ _sulfur}\right) = \left(\frac{0.004 \ pounds}{tons \ _sulfur}\right)$$

DENR agrees and will make the appropriate change to the pounds per long ton of sulfur limit in Table 4-7 of the draft PSD air quality permit.

76. EPA disagreed with the pounds per hour emission limit for the entire sulfur recovery plant because it would not ensure each thermal oxidizer is operating properly and the method of determining compliance. EPA recommends DENR require compliance with the pound per long ton for each oxidizer.

Response: DENR addressed EPA's concerns about demonstrating compliance in Comment #79 of this document. DENR disagrees that the pound per hour emission limit is not necessary. The pound per hour emission limit is necessary to limit the potential to emit and was used in the modeling analysis to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. DENR agrees the limit based on a pounds per long ton basis verifies that each system will be operated properly. Therefore, both limits are needed. DENR will revise Chapter 4.0 of the draft PSD air quality permit to identify that the pounds per hour limit applies at all times, including periods of startup and shutdown and the pounds per ton applies at all times except during startup, shutdown, and malfunctions.

77. Hyperion states Unit #42, which is the sulfur recovery plant, is more accurately described on page 4 of the draft PSD air quality permit as being comprised of six "trains" instead of six "lines".

Response: DENR agrees with this requested change and revised Table 1-1 of the draft PSD air quality permit appropriately.

78. Jenner & Block states the BACT analysis for the short term sulfur dioxide emissions from the sulfur recovery plant does not consider process train outages.

Response: Jenner & Block hypothesizes a process breakdown of the tail gas treating unit within the sulfur recovery plant. Due to this breakdown, there would be higher sulfur dioxide emissions because there would be a time delay between when one of the two redundant process trains not in operation would become operational from a cold start.

DENR agrees this type of breakdown would generate higher emissions during those periods. Because Hyperion identified there are two redundant process trains and four of the six process trains are needed to operate the facility, all the process trains could be in operation and if a malfunction of one of the process trains occurs, a valve could easily be switched to move the gases from the malfunctioning process train to one of the five remaining operating process trains.

DENR included a limit on the number of process trains Hyperion could operate at a single time to provide an operational limit to enforce the 2,040 long tons of sulfur input to the sulfur recovery plant per day. In considering Jenner & Block's concern, all six of the process trains would need to be in operation. Therefore, the restriction on the number of process trains would need to be removed from permit condition 5.5 of the draft PSD air quality permit. Due to the removal of this operational limit, DENR will include a combined operational limit of 2,040 tons of sulfur input to the six process trains per day in permit condition 5.5. Compliance with the 2,040 tons of sulfur input to the six process trains per day will be based on recordkeeping (permit condition 3.6) and reporting (permit condition 3.8). This proposed revision does not change the requirement that the sulfur recovery plant is limited to a combined 114.2 pounds per hour or each process train is limited to 1.3 pounds per long ton.

79. Jenner & Block claims the draft PSD air quality permit fails to include any federally enforceable continuous parameter monitoring requirements addressing the sulfur input flux to each of the sulfur recovery unit thermal oxidizer process trains so Hyperion can demonstrate compliance with the emission limit of 0.056 pounds of sulfur dioxide per long ton of sulfur for each unit. Jenner & Block recommends DENR resolve this compliance monitoring issue.

Response: One of the most reliable methods to demonstrate compliance with an emission limit is the use of a continuous emission monitoring system. A continuous emission monitoring system is able to collect emission concentration on a real time basis that may be quantified into the appropriate emission rates to demonstrate compliance. As noted in Chapter 11.0 of the draft PSD air quality permit, the continuous emission monitoring system has to be developed to report the emission rates that conform to the applicable emission limits, which includes emission rates in pounds per hour, pounds per million Btus, and pounds per ton.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

80. Jenner & Block alleges a proper top-down BACT analysis was not performed for the sulfur recovery plant.

Response: Jenner & Block did not provide any documentation identifying a more stringent emission limitation is being achieved or has been required elsewhere. DENR

again reviewed its Statement of Basis, Hyperion's application, other state permits and permitting decisions and did not find a more stringent limitation than identified in the draft PSD air quality permit.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

81. Jenner & Block claims the emissions from the molten tank storage and molten sulfur product loading are not addressed.

Response: Hyperion's application did address the emissions from the molten storage tanks and the molten sulfur product loading. As discussed in the application, the sulfur recovery trains would share common molten sulfur storage tanks and a common rail loading facility. These emission sources are considered part of the sulfur recovery plant. Specifically, the loading facility is vapor balanced with the sulfur storage tank and the emissions from the storage tank are routed to the sulfur recovery plant.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

8.0 IGCC Power Plant

82. On page 27 of the draft PSD air quality permit, in Table 4-1, the PM10 emission limit for the coal/coke unloading building, the flux unloading building, and the slag loading building are listed as 2.4 pounds per hour each. Hyperion believes this is a transcription error and recommends that the limits should be 0.84 pound per hour from the coal/coke unloading building, 0.42 pound per hour from the flux unloading building and 0.42 pounds per hour from the lag loading building.

Response: DENR reviewed the application and Statement of Basis and agrees there was a transcription error on the hourly emission limits. The PM10 emission limits of 0.84, 0.42 and 0.42 pounds per hour for the coal/coke unloading building, flux unloading building, and lag loading building, respectively, were identified in the application and used in the modeling to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. DENR agrees with this requested change and revised Table 4-1 of the draft PSD air quality permit appropriately.

83. EPA requests a sulfur dioxide BACT analysis for the coker drum steam vents since the background document for 40 CFR Part 60, Subpart Ja identifies these emission points as significant sources of sulfur dioxide emissions. EPA recommends DENR review the PSD air quality permit issued to Marathon Petroleum Company in Michigan on June 20, 2008, to determine if the 2.0 pounds per square inch gauged is technically feasible for these units.

Response: EPA identifies there will be significant sulfur dioxide emissions from the delayed coking units through the steam vents based on the May 14, 2007, federal register notice. The sulfur dioxide emissions identified in the federal register notice are produced by the combustion of the hydrogen sulfide emissions released from the coking process. The types of emissions released by the coking vent are particulate matter, volatile organic compounds and hydrogen sulfide. Hyperion conducted a BACT review of each of these regulated NSR pollutants. Even in Marathon's emission estimate analysis, Marathon does not identify any sulfur dioxide emissions from the coke drum vents. However, Marathon does identify sulfur dioxide emissions from the coker flare (a combustion source).

The New Source Performance Standard (Subpart Ja) promulgated by EPA on June 24, 2008, does not specify a numerical emission limit for a regulated pollutant for a delayed coking system. EPA decided the best way to limit emissions for a delayed coking system was the work practice standard.

Although EPA identifies the permit issued to Marathon Petroleum Company on June 20, 2008, as a PSD air quality permit, it was not issued under the PSD regulations. Marathon accepted emission restrictions based on actual to a projected actual test to allow the Marathon facility to forgo the PSD review (see chapter 7 of technical document). Since Marathon did not go through the PSD permitting process, this permit does not suggest a lower work practice standard limit is considered cost effective. DENR still does not consider the lower work practice standard as cost effective.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

84. Hyperion recommends the phrase "electric utility plant" be rephrased to "integrated gasification combined cycle power plant" on page ii of the draft PSD air quality permit because the phrase may potentially be confusing since the facility will not produce electricity for sale.

Response: DENR agrees with this requested change and revised page ii of the draft PSD air quality permit appropriately.

85. A group of individuals asked about what type of data was available to verify the use of IGCC systems is a viable technology.

Response: DENR agrees IGCC is a promising technology available for use to produce electricity. The Department of Energy's National Energy Technology Laboratory maintains a database identifying these types of gasification systems. This database contains 167 gasification systems in different phases such as in operation, initial startup, and under development or construction. These gasification systems are used to produce

power, chemicals or gaseous fuels. The database lists 32 gasification systems in different phases and will produce power (electricity) throughout the world.

The database lists two gasification systems in the world in operation, produce power and have a generating capacity greater than 500 megawatts. Both of these gasification systems are located in Italy. There are two gasification systems in the United States in operation, produce power and have a generating capacity greater than 200 megawatts. Both of these gasification systems were supported in part by the Department of Energy as demonstration projects. These projects were fired originally on bituminous coals and blends of bituminous coals with other fuels such as petroleum coke.

The database lists nine gasification systems designed to use petroleum coke as the feed stock, which is similar to that proposed by Hyperion. Five of those nine gasification systems are listed as in operation. There is even a gasification process in North Dakota that converts lignite coal into natural gas and other products.

Therefore, there is data available for review by DENR and the public.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

8.1 Combustion Turbines

86. Hyperion recommends on page 21 of the draft PSD air quality permit, permit condition 3.6(4) include the quantity of distillate oil burned on both a daily basis and on a 365-day rolling sum basis. In addition, Hyperion recommends on page 23 of the draft PSD air quality permit, permit condition 3.8(10) requires each quarterly report submitted by Hyperion indicate, for each month in the reporting period, the number of hours that each combustion turbine burned distillate oil on a monthly basis and on a 12-month rolling sum basis. Hyperion believes instead of the number of hours in each month, the report should require the quantity of distillate oil burned, on both a daily basis and on a 365-day rolling sum basis.

Response: Hyperion requested these changes because of another comment in which they request a change from the number of hours the combustion turbines operate in a 12-month rolling period to limiting the heat input from ultra low sulfur distillate oil on a 12-month rolling period (see Comment #111 of this document). There is some confusion if Hyperion is requesting a 12-month rolling period as described in one of their comments or a 365-day rolling period as described in this comment. DENR agrees to limit the heat input from ultra low sulfur distillate oil on a combined basis for all five combustion turbines in a 365-day rolling total. The 365-day rolling total is consistent with several other annual limits in the draft PSD air quality permit. Therefore, permit condition 3.6(4) and 3.8(10) of the draft PSD air quality permit will be revised to eliminate the

recordkeeping and reporting requirement for the number of hours and change it to the combined heat input on a daily basis and on a 365-day rolling total.

87. Jenner & Block states that the sulfur dioxide emission rates for the combined gas cycle combustion turbines and duct burners in the model (23.96 pounds per hour) is less than the allowable short-term emission rate (42.3 pounds per hour) shown in Table 5.2.6 of the application, which underestimates the sulfur dioxide emissions in the modeling analysis.

Response: Jenner & Block is correct that Table 5.2.6 of Hyperion's application does list a sulfur dioxide emission rate of 42.3 pounds per hour for the four combustion turbines combined or 10.6 pounds of sulfur dioxide per hour for each combustion turbine separately. Hyperion modeled an emission rate of 6.0 pounds of sulfur dioxide per hour for each of the four combustion turbine or a 24 pounds of sulfur dioxide per hour for the four combustion turbines combined.

However, based on DENR's BACT analysis, Table 4-2 in the draft PSD air quality permit places a short-term sulfur dioxide BACT limit of 2.5 pounds per hour on each combustion turbine or 10 pounds per hour for the four combustion turbines combined. The pounds of sulfur dioxide per hour were calculated from the BACT parts per million by volume emission rates as follows in Equation 8-1, 8-2, 8-3, and 8-4:

Equation 8-1 - Syngas

E = 0.00052 pounds sulfur dioxide per million Btus

Equation 8-2 – Natural Gas

$$E = \left(\frac{9 \text{ ft}^{3} \text{S}}{1,000,000 \text{ ft}^{3} \text{gas}}\right) \times \left(\frac{1 \text{ lbmolS}}{385 \text{ ft}^{3} \text{S}}\right) \times \left(\frac{1 \text{ lbmolSO2}}{1 \text{ lbmolS}}\right) \times \left(\frac{64 \text{ lbsSO2}}{1 \text{ lbmolSO2}}\right) \times \left(\frac{1 \text{ ft}^{3} \text{ gas}}{1000 \text{ Btus}}\right) \times \left(\frac{1,000,000 \text{ Btus}}{1 \text{ MMBtu}}\right)$$

E = 0.0015 pounds sulfur dioxide per million Btus

Equation 8-3 – Distillate Oil

$$E = \left(\frac{15 \ lbsS}{1,000,000 \ lbsoil}\right) \times \left(\frac{7 \ lbsoil}{1 \ gallon}\right) \times \left(\frac{1 \ lbmolS}{32 \ lbsS}\right) \times \left(\frac{1 \ lbmolSO2}{1 \ lbmolS}\right) \times \left(\frac{64 \ lbsSO2}{1 \ lbmolSO2}\right) \times \left(\frac{1 \ gallon}{0.14 \ MMBtu}\right)$$

E = 0.0015 pounds sulfur dioxide per million Btus

Equation 8-4 – Combustion Turbine

$$E = \left(\frac{0.0015 \ lbsS02}{1 \ MMBtu}\right) \times \left(\frac{1,677 \ MMBtu}{1 \ hour}\right)$$

E = 2.5 pounds per hour

The BACT emission limit is less than the emission total used in the model. Therefore, the modeled emission rate is higher than the allowable sulfur dioxide emissions from these sources and is considered conservative.

DENR discovered in its review of this comment that the sulfur dioxide limit in Table 4-2 for the combustion turbines is incorrect because of a typographical error and should be 2.5 pounds per hour instead of 2.3. DENR will revise Table 4-2 in the draft PSD air quality permit to address this error.

88. One individual asked why there was a large variation of allowable PM10 emission limits for the combined gas cycle turbines depending on what fuel they use.

Response: The BACT emission limit is specific to a unit and, in this case, to the different types of fuels used by that unit. Therefore, there would be a different BACT emission limit for one type of fuel versus another. In these cases, Hyperion is required to use the fuel type that has the greatest BACT emission limit when they model to demonstrate they will not cause a violation of a federal National Ambient Air Quality Standard or PSD increment.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

89. On pages 37 through 40 of the draft PSD air quality permit, in Table 4-3, the nitrogen oxide emission limit for each combined cycle gas turbine is stated as 10.5 pounds per hour. Hyperion believes the limit appears to be a transcription error and specifies that the limit should be 29.8 pounds per hour.

Response: DENR reviewed the application and Statement of Basis and agrees that there was a transcription error on the hourly emission limits. The nitrogen oxide emission limit of 29.8 pounds per hour was identified in the application and used in the modeling to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments. DENR will revise Table 4-3 of the draft PSD air quality permit appropriately.

90. Jenner & Block state the BACT analysis does not consider fuel cleaning for nitrogen or ultra low NOx burners for the combustion turbine Duct Burners.

Response: Jenner & Block did not provide any documentation supporting the statement that syngas, tail gas or natural gas have significant levels of nitrogen content and did not note where a facility elsewhere has used an ultra low NOx burner. DENR reviewed its analysis, Hyperion's application, other state permits and permit decisions and did not locate a nitrogen oxide emission limit more stringent than that established in the draft PSD air quality permit.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

8.2 Power Island Acid Gas Removal System

91. Jenner & Block alleges Hyperion's application should identify the fate of nitrogen oxides that may be contained in syngas from oxidation of any nitrogen compounds contained in coke or coke feed stocks. In addition, the nitrogen oxide concentrations in the CO2 vent gas should be identified under all Rectisol plant operating conditions.

Response: Jenner & Block did not provide any documentation identifying that nitrogen oxide would be produced in the CO2 vent gas. DENR reviewed its Statement of Basis, Hyperion's application, other state permits and permit decisions and could not locate any information on nitrogen oxide emissions being generated and emitted from the CO2 vent gas. If Hyperion becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, that information is required to be submitted promptly for consideration.

Without additional information, DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

92. On page 50 of the draft PSD air quality permit, in Table 4-7, the hydrogen sulfide emission limits for the acid gas removal system are stated as 3.0 parts per million by volume and 4.2 pounds per hour. Hyperion believes the inclusion of the two separate limits is redundant and one of the two limits should be deleted.

Response: DENR proposed two limits to verify the emissions will be minimized throughout the operational range of the systems and to limit the maximum emissions of hydrogen sulfide. Therefore, DENR disagrees with Hyperion that the two limits are redundant.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

93. Jenner & Block notes Hyperion identified a carbon monoxide emission rate of 2,278.29 pounds per hour used in the modeling analysis but does not mention this emission rate anywhere else in the application. Jenner & Block recommends if the IGCC CO2 vent has

the potential to emit at that rate then Hyperion must address the BACT consequences. In addition, Jenner & Block indicates Hyperion failed to consider other hydrogen sulfide controls for the IGCC CO2 vent.

Response: In the application, Hyperion identified the BACT emission limit to be 20 parts per million by volume on a 24 hour basis, excluding startup, shutdown, and malfunctions and a limit of 25.1 pound per hour on a 365-day average, including startup, shutdown, and malfunctions. Converting the 20 parts per million by volume at the maximum flow rate through the system to a pounds per hour emission rate is approximately equivalent to 25.1 pounds per hour. DENR considers these requirements as the BACT emission limits. The pounds per hour emission rate on the 365-day average including startup, shutdown, and malfunction forces Hyperion to minimize the emissions during startup, shutdown, and malfunctions and the frequency of these events. If Hyperion emits 2,279 pounds per hour of carbon monoxide for more than 97 hours in a 365 day period and Hyperion did not operate the rest of the year, Hyperion would not be able to meet the 25.1 pounds per hour average over 365 days.

Jenner & Block notes Hyperion failed to consider a packed tower with caustic scrubbing and industrial implementation of a bio-filtration system in its control technology analysis for hydrogen sulfide. Jenner & Block did not provide any documentation that these types of controls have been required at another facility or a more stringent emission limitation for hydrogen sulfide has been required. DENR reviewed its available documentation and did not locate a more stringent limitation.

As Jenner & Block notes, Hyperion did model an emission rate of 2,279 pounds of carbon monoxide per hour to demonstrate compliance with the National Ambient Air Quality Standards for carbon monoxide. To enforce the modeling parameters, DENR agrees to include the 2,279 pounds of carbon monoxide per hour emission rate as an emission limit and proposes the compliance period to be based on a 3 hour rolling average in Table 4-5 of the draft PSD air quality permit.

9.0 Cooling Towers

94. EPA indicated there is a difference in what Hyperion proposed in the application for its particulate matter BACT determination for the cooling towers and what DENR established in the draft PSD air quality permit. EPA mentioned they did not see a discussion on the BACT analysis in DENR's Statement of Basis. EPA recommended DENR require the design parameters for the cooling tower, establish it in the draft PSD air quality permit, and require monitoring and recordkeeping to verify compliance.

Response: DENR's review of the BACT analysis for the cooling towers is found on page 68 and 69 of the Statement of Basis. DENR agreed the BACT limit proposed by Hyperion was a drift efficiency design requirement and placed that requirement in permit condition 5.3 of the draft PSD air quality permit. DENR agreed with Hyperion that it is

not feasible to conduct a performance test at both the inlet and outlet of the cooling tower to verify the design efficiency. Therefore, compliance with the design efficiency is based on documentation from the manufacturer. DENR will revise condition 5.3 of the draft PSD air quality permit to clarify the compliance demonstration with the design efficiency.

For the modeling, Hyperion calculated a pound per hour emission rate for the cooling tower by using a mass balance. Even though direct compliance with the efficiency is not available, verifying the mass balance calculation is available as an indirect approach. DENR agrees Hyperion should monitor the total dissolved solids in the cooling water and monitor the recirculation water flow rate. By obtaining this information and assuming the design efficiency of the cooling tower, the pound per hour emission rate may be calculated to determine compliance with the particulate matter emission limit. Therefore, DENR will revise Table 4-1 of the draft PSD air quality permit to include the particulate matter emission rate Hyperion used in the model (1.2 pounds per hour) to demonstrate compliance with the National Ambient Air Quality Standards and PSD increments as a BACT emission limit. DENR will add a permit condition 10.15 in the draft PSD air quality permit to specify the monitoring and mass balance calculation as the compliance method.

95. Jenner & Block states Hyperion failed to conduct a proper "Top-Down" approach in determining BACT for the cooling towers and the draft PSD air quality permit does not contain an emission limit or monitoring requirements for demonstrating compliance.

Response: DENR discussed a "Top-Down" approach of determining BACT is one method of determining BACT but is not the only method (see Comment #11 of this document). As noted in Hyperion's application, the volatile organic compound emissions from the cooling tower are due to hydrocarbons leaking from a heat exchanger into the cooling water. The hydrocarbons then evaporate from the cooling water to the atmosphere. The BACT analysis reviewed the methods to minimize the leaks from the heat exchangers through a work practice standard. The work practice standard requires Hyperion to monitor for hydrocarbon in the cooling water to determine if there is a leak and then repair that leak as soon as possible. Hyperion estimated the amount of volatile organic compound emissions by using EPA's AP-42 document.

DENR agrees the leak detection plan does not specify a monitoring method or a leak detection level. DENR reviewed the proposed revisions to 40 CFR Part 63, Subpart CC. In permit condition 14.13, DENR will include the detection level of 3.1 parts per million by volume as methane, a requirement to monitor on a weekly basis, and the opportunity to reduce the monitoring frequency to monthly. Since this subpart has not been finalized, DENR will specify that the monitoring has to meet the requirements of water monitoring regulations under 40 CFR Part 136 or under 40 CFR Part 63 Subpart CC.

10.0 Tank Farm Thermal Oxidizers

96. On page 53 of the draft PSD air quality permit, permit condition 5.11 requires the use of closed vent systems and thermal oxidizers to control volatile organic compound emissions from storage vessels. Hyperion recommends this permit condition be deleted entirely based on the information they provided in Enclosure B of the comments Hyperion submitted.

Response: Hyperion and DENR agree that installing a thermal oxidizer to control the emissions from the storage tanks is a technically feasible control option. However, Hyperion and DENR disagree if that control technology is cost effective. As noted in DENR's Statement of Basis on page 113, Arizona Clean Air Fuels required a thermal oxidizer on a specific set of storage tanks during its PSD review. In addition, DENR contacted Santa Barbara and asked them if Rule 325 would likely apply to new refinery storage tanks and DENR was informed that, yes, it would. Therefore, there is some precedent a thermal oxidizer has been and would be considered BACT.

Hyperion estimated it would cost \$24 million for two thermal oxidizers and aboveground piping. The cost analysis also identifies the accuracy of the cost estimate is within +/- 50 percent. DENR also identified that in its experience with the cost of installing a thermal oxidizer, those costs do not correlate with the cost estimate provided by Hyperion. In 2004, DENR submitted a letter to Continental Resources requesting information on the emissions from its oil and gas production facility in Harding County. Continental Resources provided information on its volatile organic compound emissions from approximately 50 vents generated from its wells covering several square miles. In 2005, Continental Resources installed four thermal oxidizers and 34 miles of pipe to control the volatile organic compound emissions. The total cost of the project was \$5.8 million.

Based on a review of the thermal oxidizer costs, DENR still considers the requirement for the tank farm thermal oxidizers cost effective. Hyperion requested the flexibility to store different liquids in each of the tanks, instead of having each tank limited to a specific liquid. DENR tried to accommodate this request by requiring tanks that store a liquid with a maximum true vapor pressure greater than 0.3 pounds per square inch be hooked up to the thermal oxidizer.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

97. On pages 8 through 18 of the draft PSD air quality permit, Table 1-1 includes 106 references to thermal oxidizers controlling volatile organic compound emissions from storage tanks. Hyperion does not agree the tank farm thermal oxidizer as required by DENR is economical, and requests these references to the tank farm thermal oxidizer be deleted entirely.

Response: Hyperion provided additional information on their estimated cost of installing thermal oxidizers for controlling volatile organic compounds from the tank farm. Hyperion believes this information shows DENR's requirement is not economically viable. DENR disagrees with Hyperion's economic analysis as discussed further in Comment #96 of this document.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

98. On pages 16 and 17 of the draft PSD air quality permit, in Table 1-1, Units #166 through #171 are required to be equipped with internal floating roofs and vent emissions to one of two thermal oxidizers (Units #175 or #176). Hyperion stated the volatile organic compound emissions from these tanks will instead be controlled by the vacuum-regenerated, carbon adsorption-based vapor recovery systems serving the railcar and truck loading racks (Units #43 and #44).

Response: DENR agrees a vacuum-regenerated, carbon adsorption-based vapor recovery system is equivalent if not more environmentally friendly then a thermal oxidizer. DENR will revise the control device description for Unit #166 through #171 in Table 1-1 of the draft PSD air quality permit appropriately.

99. On page 18 of the draft PSD air quality permit, footnote 4 states "the thermal oxidizer may or may not be required depending on permit condition 5.11." Hyperion believes the reference to these thermal oxidizers should be deleted entirely or the footnote should be stated as, "The use of the thermal oxidizer for this tank may or may not be required depending on the compliance option selected under permit condition 5.11."

Response: DENR agrees with the latter option and will revise footnote "4" in Table 1-1 of the draft PSD air quality permit appropriately.

100. Hyperion recommends on page 29 of the draft PSD air quality permit, the PM10 BACT emission limit in Table 4-1 for each tank farm thermal oxidizer should be deleted.

Response: As discussed in response to Comment #96 of this document, DENR is proposing the requirement that a thermal oxidizer system be installed and used to reduce volatile organic compound emissions from the tank farm. Therefore, the particulate matter BACT emission limit as proposed by DENR is still required.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

101. On pages 34 and 35 of the draft PSD air quality permit, in Table 4-2, the sulfur dioxide emission limit for each tank farm thermal oxidizer is a hydrogen sulfide concentration limit of 25 parts per million by volume in the refinery gas. Hyperion recommends the

reference to the thermal oxidizer be deleted. If the thermal oxidizers are still required, Hyperion recommends the permit condition should be revised to clarify that the vapors from the storage tanks are not "refinery gas" for the purposes of this permit condition.

Response: As discussed in response to Comment #96 of this document, DENR is proposing the requirement that a thermal oxidizer system be installed and used to reduce volatile organic compound emissions from the tank farm. Therefore, the sulfur dioxide BACT emission limit as proposed by DENR is still required.

The term "refinery gas" does not refer to the gas the storage tanks produce. The term "refinery gas" references one of the two auxiliary fuels allowed to be burned in the thermal oxidizer. The other auxiliary fuel is listed as natural gas. The description of the thermal oxidizer also acknowledges the other gas to be burned by the thermal oxidizer is the vapors generated from the operation of the storage tanks.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

102. On page 40 of the draft PSD air quality permit, in Table 4-3, the nitrogen oxide emission limit for each tank farm thermal oxidizer is stated as 0.04 pound per million Btu. Hyperion recommends the reference to these thermal oxidizers should be deleted entirely. Hyperion recommends if the thermal oxidizers are still required, the limit should be 0.2 pounds per million Btu heat input and the permit condition should be revised to clarify the heat input is based on the total heat input to the oxidizer, including the heat input from tank vapors and sweep gas as well as auxiliary fuel.

Response: As discussed in response to Comment #96 of this document, DENR is proposing the requirement for a thermal oxidizer. Therefore, the nitrogen oxide BACT emission limit is still required.

The BACT limit was based on Arizona Clean Fuel's PSD air quality permit and was verified by the review of the stack test data from Continental Resources four thermal oxidizers. The average nitrogen oxide concentration of eight performance tests varied from 3 parts per million to 33 parts per million at 2 to 3 percent oxygen.

Equation 10-1 converts the parts per million to pounds per cubic foot and Equation 10-2 which is derived from 40 CFR Part 60, Appendix A, Method 19 convert pounds per cubic foot to pounds per million Btu, the nitrogen oxide emission rate varied between 0.003 to 0.038 pounds per million Btus:

$$(Concentration) = \frac{(ppm)x(MW)x(6.24x10^{-11})}{(0.02404)}$$

Where:

- Concentration = pounds per cubic foot;
- ppm = parts per million; and
- MW = molecular weight of the compound (46 for nitrogen dioxide).

Equation 10-2

$$E = (Cd)x(Fd)x\left(\frac{20.9}{20.9 - O2}\right)$$

Where:

- E = emission rate in pound per million Btu;
- Cd = pollutant concentration in pounds per cubic foot on a dry basis;
- Fd = Fuel Type Factor -8,710 dry standard cubic foot per million Btu; and
- O2 = percent oxygen.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

103. On page 43 of the draft PSD air quality permit, in Table 4-4, the volatile organic compound emission limit for each tank farm thermal oxidizer is stated as either 98 percent destruction efficiency or 20 parts per million by weight, whichever is less stringent. Hyperion recommends the reference to the thermal oxidizer should be deleted. Hyperion recommends if the thermal oxidizers are still required, in the alternative, the concentration limit should be expressed as 20 parts per million by volume.

Response: As discussed in response to Comment #96 of this document, DENR is proposing the requirement for a thermal oxidizer. Therefore, the volatile organic compound BACT emission limit is still required. DENR did review the permit and agrees the appropriate description of 20 parts per million by weight should be 20 parts per million by volume. DENR will revise Table 4-4 of the draft PSD air quality permit accordingly.

104. On page 47 of the draft PSD air quality permit, the carbon monoxide emission limit for each tank farm thermal oxidizer is stated as 0.08 pounds per million Btu heat input. Hyperion requests the reference to a thermal oxidizer be deleted.

Response: As discussed in response to Comment #96 of this document, DENR is still proposing the requirement for a thermal oxidizer. Therefore, the carbon monoxide BACT emission limit as proposed by DENR is still required.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

105. EPA disagreed with DENR's approach of only requiring emissions from tanks storing liquids with a maximum true vapor pressure greater than or equal to 0.3 pounds per square inch be routed to one of two thermal oxidizers. EPA believes DENR can establish a BACT based on the maximum degree of reduction achievable for this pollutant with consideration to cost and still provide operational flexibility. EPA recommends DENR revise permit condition 5.11 to include additional design and operational restrictions to ensure the tank farm thermal oxidizers comply with the BACT emission limits beyond the initial performance test.

Response: EPA does not explain why they disagree with DENR's approach or how they believe the maximum degree of reduction can be achieved and still provide flexibility. DENR believes its approach provides Hyperion with some operational flexibility and meets the requirements under the PSD air quality permit program. Hyperion will produce many petroleum products and store them in the storage tanks. DENR considered the storage tanks would store volatile liquids with a vapor pressure above and below 0.3 pounds per inch. DENR considered it economical to route the emissions from those tanks storing liquids with a vapor pressure above 0.3 pounds per inch. DENR did not consider it economical to route the emissions from those tanks that have a vapor pressure less than 0.3 pounds per inch. Therefore, DENR established two operating scenarios for Hyperion to choose. Hyperion can either limit the product that a specific tank may store, which will limit some of its flexibility, or route the emissions from the tanks to a thermal oxidizer, which will give Hyperion the most flexibility.

The PSD air quality permit program is a preconstruction permit program that establishes the control equipment and emission limits a facility has to meet once it begins operation to ensure compliance with the National Ambient Air Quality Standards and PSD increments. The permit establishes methods to demonstrate compliance with the emission limits or work practice standards such as a continuous emission monitoring system, a performance test, recordkeeping and/or reporting requirements, and other appropriate methods. The volatile organic compound BACT limit for the tank farm thermal oxidizer is a 98% destruction efficiency or 20 parts per million by volume.

The combustion chamber temperature and residence time are design parameters that a manufacturer will consider to meet this requirement and Hyperion will use to demonstrate compliance. However, this information is not available because the equipment has not been purchased. The Title V air quality permit program requires periodic monitoring and/or compliance assurance monitoring to verify compliance with all the applicable emission limits, including those in a PSD air quality permit. Hyperion is required to submit an application for a Title V air quality permit within 12-months after beginning operation. The 12 month period is needed for a facility to obtain operational information in conjunction with the data collected by the methods specified in the draft PSD air quality permit for determining what parameters it needs to monitor to demonstrate ongoing compliance with the applicable limits. This information will be submitted with the Title V air quality permit application and the appropriate parameters will be placed in

the Title V air quality permit to verify periodic and continuous compliance. The Title V air quality permitting process is subject to public input.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

11.0 Startup, Shutdown and Malfunction Plan

106. One individual requested the Startup, Shutdown and Malfunction plan required in permit condition 5.10 be submitted before construction begins and reviewed by the state and public to make sure it is feasible, safe, and Hyperion can operate within the emission limits established in the draft PSD air quality permit.

Response: Permit condition 5.10 of the draft PSD air quality permit requires Hyperion to develop, maintain, and implement a Startup, Shutdown and Malfunction plan to ensure the equipment, controls and monitoring devices are operated at all times to satisfy the duty of minimizing air emissions and Hyperion is prepared to correct malfunctions assoon-as-practical after they occur to reduce air emissions. In accordance with permit condition 4.8, the Startup, Shutdown and Malfunction plan is required to be submitted and approved by the Secretary at least 90 days prior to the initial startup of the petroleum refinery.

The plan is a working document, which means that it will change as Hyperion continues to operate and becomes familiar with its operations. DENR agrees that the initial plan and revisions should be submitted to DENR for review and approval. The submittals will also give a third party an opportunity to review the plan and determine if they agree with the plan. The initial plan is already required to be submitted and approved under permit condition 4.8 of the draft PSD air quality permit; but DENR agrees this is confusing and will revise the draft PSD air quality permit by deleting this requirement from permit condition 4.8 and moving it to permit condition 5.10. In addition, DENR will revise permit condition 5.10 by requiring Hyperion to submit revisions to the Startup, Shutdown and Malfunction plan for approval by the Secretary.

107. EPA mentioned it is concerned permit condition 4.8 exempts Hyperion from compliance with a numerical BACT emission limit during periods of startup, shutdown, and malfunction. EPA stated a BACT limit must be numerical and there may be other means to calculate emissions during these periods or surrogate measurements could be employed to demonstrate compliance when a continuous emission monitor is not required and stack testing is not feasible. Jenner & Block claimed startup, shutdown and malfunction operating scenarios are considered part of normal operations for any source and must be considered in the BACT analysis.

Response: DENR disagrees the BACT limit must be a numerical limit, but does agree there are other methods of demonstrating compliance when a continuous emission

monitor and/or stack test is not feasible or impractical. DENR's disagreement with EPA's position that the BACT emission limit must be numerical is in the definition of BACT.

As defined in 40 CFR § 52.21(b)(12), BACT means an "...emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act, which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis taking into account energy, environmental, and economic impacts and other costs, determines is achievable through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques, for control of such pollutant. In no event can the application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard in 40 CFR Parts 60 and 61..."

From the first part of the definition, the regulations require an emission limitation and clarifies that it cannot be less stringent than a standard promulgated in 40 CFR Part 60 (New Source Performance Standards) and 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants). DENR would agree if that was the end of the definition it would appear to require an emission limitation; however, to continue to read the definition of BACT, it states, "...if it is determined that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such a standard is, to the degree possible, required to set forth the emissions reduction achievable by implementation of the design, equipment, work practice or operation, and is required to provide for compliance by means which achieve equivalent results."

Therefore, if you read the definition for BACT in its entirety, the federal regulations give DENR the latitude to determine if BACT is a numerical emission limit or an emission limitation that provides the Best Available Control Technology and the method of determining compliance is enforceable in a practical manner. DENR believes there are other methods of determining compliance with a BACT emission limitation during startup, shutdown, and malfunctions and that relates to the Startup, Shutdown, and Malfunction plan required in the draft PSD air quality permit.

In determining if there are technological limits on the application of measurement methodology during periods of startup, shutdown and malfunctions, DENR reviewed EPA's regulations concerning stack testing. As noted in the definition of BACT, 40 CFR Part 60 establishes the minimum requirements. The requirement for Part 60 rules has similar language as the definition for BACT. The new source performance standards are developed under the authority of Section 111 of the Clean Air Act. As defined in Section 111(a)(1) of the Clean Air Act, the term "standard of performance" means "a standard of

emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."

In 40 CFR §60.11(a), which is part of the general requirements for the New Source Performance Standards, it notes compliance with the standards in this part shall be determined in accordance with performance tests established by 40 CFR §60.8 unless specified in a specific subpart. In 40 CFR §60.8(c), it states the performance tests shall be conducted under representative conditions. Operations under periods of startup, shutdown, and malfunctions shall not constitute representative conditions and exceedances of an emission limit during these periods are not considered a violation of the standard unless otherwise specified in a specific subpart. Therefore, under 40 CFR Part 60, EPA recognizes that performance tests during periods of startup, shutdown, and malfunction are not practical and does not require compliance during these periods with the emission limits established in the New Source Performance Standards.

The Clean Air Act also established requirements for hazardous air pollutants which also have similar language as the definition for BACT. The standard for hazardous air pollutants is referred to as the maximum achievable control technology are developed under the authority of Section 112 of the Clean Air Act and promulgated in rule under 40 CFR Part 63. As defined in Section 112(d)(2) of the Clean Air Act, it notes that emission standards promulgated under the subsection and applicable to new or existing sources of hazardous air pollutants shall require the maximum degree of reduction in emissions of the hazardous air pollutants subject to this section (including a prohibition on such emissions, where achievable) the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing sources in the category or subcategory to which such emission standard applies, through application of measures, processes, methods, systems or techniques including, but not limited to, measures which A) reduce the volume of, or eliminate emissions of such pollutants through process changes, substitution of materials or other modifications, B) enclose systems or processes to eliminate emissions, C) collect, capture or treat such pollutants when released from a process, stack, storage or fugitive emissions point, D) are design, equipment, work practice, or operational standards (including requirements for operator training or certification) or E) are a combination of the above.

In 40 CFR §63.6(f)(1), which is part of the general requirements of the MACT standards, it states the emission standards set forth in this part shall apply at all times except during periods of startup, shutdown, and malfunction. In 40 CFR §63.6(f)(2), it states compliance with emission standards are based on the results of the performance tests conducted in accordance with 40 CFR §63.7, unless otherwise specified in a specific subpart. Under 40 CFR §63.7(e), it states the performance tests shall be conducted under

representative conditions. Operations under periods of startup, shutdown, and malfunctions shall not constitute representative conditions and exceedances of an emission limit during these periods are not considered a violation of the standard unless otherwise specified in a specific subpart. Again, under 40 CFR Part 63, EPA recognizes performance tests during periods of startup, shutdown, and malfunction are not practical and does not require compliance during these periods with the emission limits established in the Maximum Achievable Control Technology Standards.

As indicated by the federal rules developed under two separate programs have similar technological requirements, both BACT and MACT rules recognize there are technical issues with conducting performance tests during startup, shutdown, and malfunctions. Some of those issues involve the length of time a startup or shutdown occurs. Most performance tests are based on the average of three one hour tests. If the startup or shutdown process does not last an hour, a valid test may not be completed. It is not prudent to have a facility to continually startup and shutdown a piece of equipment just to complete a performance test. The excess startup and shutdown of equipment causes unnecessary wear and tear on the equipment and is not representative of the air emissions during normal operation. It is also not prudent to require a facility to recreate a malfunction because this also causes unnecessary wear and tear on the equipment, would be difficult to duplicate, and is not representative of the air emissions during normal operation.

There are other issues with conducting a valid performance test during startup or shutdown. Examples are that performance tests are to be carried out in "isokinetic" conditions, which means the linear velocity of the gas entering the sampling nozzle is equal to the undisturbed gas stream at the sampling point, or under laminar flow. The gas flow rate during a startup or shutdown is too transient to meet these conditions. Conducting a performance test during non isokinetic conditions and when there are cyclonic or swirling gases present will not meet the requirements for representative sampling as specified for the performance tests.

There are continuous emission monitoring systems available that can monitor the emission concentrations of specific pollutants, such as sulfur dioxide, nitrogen oxide, and carbon monoxide during startup, shutdown, and malfunctions. These continuous emission monitoring systems generally use a stoichiometric system of measurement, which uses basic laws of chemical activity to derive emissions.

As noted in the Statement of Basis (page 137) and specified in the draft PSD air quality permit, for units and pollutants in which compliance with a BACT emission limit is based on continuous emission monitoring equipment, the BACT emission limit includes periods of startup, shutdown, and malfunctions unless otherwise specified in the section. For those units and pollutants, compliance is not based on a continuous emission monitoring system; a performance test has been required to demonstrate compliance with the BACT emission limits during representative conditions. Startup, shutdown, and malfunctions

are not considered by EPA's regulations or by DENR to be representative conditions to conduct a performance test.

In situations where a direct method such as a performance test or a continuous emission monitoring system to demonstrate compliance with a BACT emission limit is not practical and not enforceable, then an indirect compliance method was developed by DENR. Therefore, to ensure air emissions are minimized to the extent practical during periods of startup, shutdown, and malfunctions, a Startup Shutdown and Malfunction plan is being proposed by DENR.

The draft PSD air quality permit is required to be obtained prior to the facility beginning construction so that the facility knows what control technology and emissions limits that it will have to meet before it finalizes the design of the facility and orders the equipment. Until these decisions are made, detailed designs of the facility and in some cases the manufacturer of the equipment are not available. Since the startup and shutdown procedures are generally based on the manufacturer specifications, if the manufacturer specification are not available because the specific equipment has not been purchased at the time of issuance of the permit, the detailed designs of the startup, shutdown, and malfunction plan is not available. Therefore, permit condition 4.8 of the draft PSD air quality permit specifies that a Startup, Shutdown, and Malfunction plan shall be developed, the plan has to include the specified portions, and the plan must be submitted to DENR and approved at least 90 days prior to initial startup. Once the plan is submitted to DENR, the public has the opportunity to review that plan.

DENR's intention was not only to have initial Startup, Shutdown and Malfunction plan submitted and approved but also any revisions to the plan. Therefore, DENR revised permit condition 5.10 to require any revisions of the plan be submitted and approved by DENR. This will also provide third parties the most current plan to review if they so wish.

108. Jenner & Block claim the draft PSD air quality permit impermissibly excludes startup, shutdown or malfunctions emissions in various locations. One example Jenner & Block provided was footnote #1 for Table 4-2 of the draft PSD air quality permit. Another example that Jenner & Block identified is permit condition 9.1 of the draft PSD air quality permit, which does not consider an exceedance of the opacity limit during brief periods of soot blowing, startup, shutdown, or malfunction a permit violation.

Response: Jenner & Block's claim that the draft PSD air quality permit impermissibly excludes startup, shutdown or malfunctions is similar to other Jenner & Block's comments and is addressed by DENR in Comment #107 of this document.

In accordance with 40 CFR §52.21(j)(1), it states that "a major stationary source or major modification shall meet each applicable emissions limitation under the State Implementation Plan". The visible emissions requirements in South Dakota's State

Implementation Plan are located in ARSD 74:36:12. ARSD 74:36:12:02 identifies that the South Dakota's opacity standard does not apply during brief periods of soot blowing, startup, shutdown, and malfunctions.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

12.0 Operation, Maintenance and Monitoring Plan

109. One individual is concerned permit condition 5.9, which requires the development, maintenance, and implementation of an Operation, Maintenance, and Monitoring plan, should be submitted 60 days prior to construction and an updated plan submitted and approved 60 days prior to startup. The individual also is concerned there is no mechanism for challenging and amending the plan.

Response: Permit condition 5.9 requires Hyperion to develop, maintain, and implement an Operation, Maintenance, and Monitoring plan to ensure all equipment is operated, maintained and monitored in a manner that minimizes air emissions and compliance with the draft PSD air quality permit. The plan is not required prior to construction because it could change dramatically from the beginning of construction to initial startup. The requirement to submit the plan within 60 days of initial startup ensures a plan is in place when Hyperion starts up. The plan is a working document, which means that it will change as Hyperion continues to operate and becomes familiar with its operations. DENR requires each revision to be submitted and approved. DENR's records are open to the public which allows a third party an opportunity to review the plan and determine if they agree with the plan.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

13.0 Operational Restrictions

110. On page 50 of the draft PSD air quality permit, permit condition 5.2 prohibits the sale of hydrogen, steam or electricity to "an outside entity". Because this term is not defined in the air pollution control regulations and is potentially ambiguous, Hyperion suggests the prohibition apply to the sale of these commodities "outside the Hyperion Energy Center major stationary source."

Response: DENR reviewed the two descriptions and agrees with this requested change and revised permit condition 5.2 of the draft PSD air quality permit appropriately.

111. On page 51 of the draft PSD air quality permit, permit condition 5.6 limits each of the five combustion turbines to burning distillate oil no more than 500 hours per year. Hyperion believes this requirement is unnecessarily restrictive and requests the limit

instead restrict the quantity of distillate oil burned in each turbine to an amount equivalent to 500 hours of operation at maximum capacity on an annual basis. Hyperion suggests the limit be phrased as either "shall not operate any of the five combined cycle combustion turbines (Unit #60 through #64) with a heat input from ultra low sulfur distillate oil in excess of 485,500 million Btus per 12-month rolling period" or "shall not operate the five combined cycle combustion turbines (Unit #60 through #64) with a heat input from ultra low sulfur distillate oil in excess of 1,942,000 million Btus per 12-month rolling period, total for all turbines."

Response: The proposed limit of 500 hours per year while burning distillate oil is recommended to limit the hourly emission rate developed for nitrogen oxide. Since the national ambient air quality standard for nitrogen oxide is an annual standard, the intention of the operational limit is to limit the hourly emission rate average over the year. Limiting the amount of distillate oil burned versus the number of hours the system burns distillate oil gives Hyperion more flexibility on the firing rate for burning distillate while still maintaining limitations for an annual average. There is some confusion on if Hyperion is requesting a 12-month rolling period as described in this comment or a 365-day rolling period as described in another comment. DENR will revise permit condition 5.6 of the draft PSD air quality permit by eliminating the 500 hours per 12-month rolling period and replace it with a combined heat input of 1,942,000 million Btus while burning ultra low sulfur distillate oil on a 365-day rolling period.

112. On page 51 of the draft PSD air quality permit, permit condition 5.8 provides "the owner or operator shall purchase a 2008 model or newer generator and fire pump." Hyperion suggests this permit condition be revised to provide "...the owner or operator shall not operate a generator or fire water pump other than a 2008 model year or newer engine.

Response: DENR agrees with adding the words "or operate" after purchase in permit condition 5.8 of the draft PSD air quality permit will make it clear to Hyperion they must purchase and operate 2008 model years or newer engines.

113. Jenner & Block recommends DENR include a permit condition in the draft PSD air quality permit prohibiting Hyperion from selling any electrical power generated.

Response: Permit condition 5.2 in the draft PSD air quality permit does not allow Hyperion to sell the hydrogen, electricity, and or steam produced from the IGCC system to an entity outside the Hyperion major stationary source.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

14.0 Recordkeeping, Reporting and Monitoring

114. EPA recommended that permit condition 10.8, 10.9, 10.10, 10.11, 10.12, and 10.13 be revised so that these conditions require periodic monitoring to demonstrate ongoing compliance.

Response: The PSD air quality permit program is a preconstruction permit program that establishes the control equipment and emissions limits that a facility has to meet once it begins operation to ensure compliance with the National Ambient Air Quality Standards and PSD increments. The PSD air quality permit establishes methods and procedures that Hyperion must follow to demonstrate compliance with the emission limits or work practice standards such as a continuous emission monitoring system, performance tests, recordkeeping and/or reporting requirements, and other appropriate methods.

The Title V air quality permit program requires periodic monitoring and/or compliance assurance monitoring to verify compliance with all the applicable emission limits on an ongoing basis, including those in a PSD air quality permit. Hyperion is required to submit an application for a Title V air quality permit within 12-months after beginning operation. The 12 month period is needed for a facility to gain experience and obtain operational information in conjunction with the data collected by the methods specified in the draft PSD air quality permit, such as the continuous emission monitoring systems and performance tests, for determining what parameters it needs to monitor to demonstrate ongoing compliance with the applicable limits. This information will be submitted with the Title V air quality permit application and the appropriate parameters will be placed in the Title V air quality permit to verify compliance on an ongoing basis. The Title V air quality permit is issued.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

115. EPA noted that permit condition 11.1, 11.2, and 11.3 allow for continuous emission monitoring system downtime to be excluded from the record. EPA recommends that DENR modify these conditions so they are subject to the requirements of 40 CFR §60.7.

Response: The exemptions for maintenance of continuous emission monitors established in permit condition 11.1, 11.2, and 11.3 are based on 40 CFR §§60.13(e), 63.8(c), and 75.10(d). According to 40 CFR §60.13(e), it states that "except for system breakdowns, repairs, calibration checks, and zero and span adjustments required under paragraph (d) of this section, all continuous monitoring systems shall be in continuous operation and shall meet minimum frequency of operation requirements". According to 40 CFR §63.8(c), it states that "except for system breakdowns, out-of-control periods, repairs, maintenance periods, calibration checks, and zero (low-level) and high-level calibration drift adjustments, all CMS, including COMS and CEMS, shall be in continuous operation and shall meet minimum frequency of operation requirements". According to 40 CFR

§75.10(d), it states that "the owner or operator shall ensure that all continuous emission and opacity monitoring systems required by this part are in operation and monitoring unit emissions or opacity at all times that the affected unit combusts any fuel except as provided in §75.11(e) and during periods of calibration, quality assurance, or preventive maintenance, performed pursuant to §75.21 and appendix B of this part, periods of repair, periods of backups of data from the data acquisition and handling system, or recertification performed pursuant to §75.20." The requirements in 40 CFR Part 60, Appendices B and F and 40 CFR Part 75, Appendices A and B describe how calibration checks, cylinder gas audits, and span adjustments are to be conducted.

Just like other equipment, a continuous emission monitoring system needs to be maintained with preventative maintenance and the system needs to be calibrated and audited on a periodic basis to verify that the system is working properly. During these periods, the system is unable to monitor the emissions from the stack. EPA understood this issue when it developed its rules for 40 CFR Part 60, 63 and 75. DENR is following the continuous emission monitoring requirements specified in federal regulations to ensure the data that is collected is accurate.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

116. Some individuals stated the draft PSD air quality permit did not appear to require the best available monitoring and reporting.

Response: Only a few individuals specified what they believe should be required as "best available monitoring." They identified the use of differential absorption light detection and ranging (DIAL), solar occultation flux (SOF), time correlation tracer (TCT), and infrared imaging camera (IRC) to measure for fugitive air emissions.

EPA has held international workshops that discuss remote sensing of emissions such as the differential absorption light detection and ranging (DIAL), solar occultation flux (SOF) and infrared imaging camera (IRC). The participants in these workshops recommend that additional information is needed in regards to these new technologies, such as developing standard protocols for data quality for the new technology and developing data to compare to the traditional monitoring methods. Without quality control and quality assurance measures, the monitoring measures are not a viable option for determining compliance at this time.

As noted in Chapter 10.0 of the draft PSD air quality permit, there are over one hundred and fifty specific performance tests that are required to be conducted and results submitted to DENR. These performance tests are required to be conducted in accordance with approved methods that establish quality assurance and quality control measures. In Chapter 11.0 of the draft PSD air quality permit, there are over one hundred and twenty five specific continuous emission monitoring systems required to be installed, calibrated,

maintained, and operated. These continuous emission monitoring systems are required to meet approved performance specifications and quality assurance measures. The results of that data are required to be submitted to DENR on a periodic basis.

During the development of the draft PSD air quality permit, DENR reviewed EPA's international workshops and memorandums involving remote sensing devices. These monitoring devices have indicated issues with fugitive air emissions from the coking process, wastewater treatment, storage tanks, refinery flares, cooling towers, and equipment leaks (e.g. pumps, valves). These areas were considered in detail in the BACT analysis and the air emission limits, operational limits, and work practice standards were developed accordingly. Examples are noted below:

- Permit condition 6.4 of the draft PSD air quality permit requires the coking process to
 meet the requirements of the recently finalized New Source Performance Standards
 under 40 Code of Federal Regulations (CFR) Part 60, Subpart Ja, which identifies an
 operational restriction and monitoring requirements to ensure compliance for coking
 processes;
- In Chapter 15.0 of the draft PSD air quality permit, DENR required operational restrictions for the wastewater treatment facility with periodic testing and monitoring requirements to ensure compliance;
- Permit conditions 1.1 and 5.11, the draft PSD air quality permit requires the storage tanks to be routed to a thermal oxidizer with associated testing and monitoring requirements to ensure compliance;
- Chapter 12.0 of the draft PSD air quality permit requires a flare minimization plan
 and does not allow flaring of routine upsets caused by startup and shutdown of the
 refinery processes. Flaring is only allowed from the refinery processes during a
 malfunction, which is an unforeseen and unavoidable failure of the refinery.
 Hyperion is required after a malfunction to conduct a cause analysis to determine
 what caused the malfunction and flaring event and what corrective actions are
 available to make sure the malfunction will not happen again in the future to
 minimize flaring;
- Permit condition 14.13 of the draft PSD air quality permit requires monitoring of the cooling tower heat exchanger to identify if any leaks are occurring and requires that the leaks be fixed; and
- Chapter 14.0 of the draft PSD air quality permit requires a leak detection program for such equipment as pumps and valves. The leak detection program requires monitoring on a more frequent basis than that established in the federal regulations such as maintaining monitoring on at least a monthly basis and not allowing reduction of monitoring to an annual basis. The leak detection program in Chapter 14.0 limits the number of non-repairable equipment, which the federal regulations do not limit. The leak detection program in Chapter 14.0 also reduced the criteria of when a leak was detected compared to the federal regulations.

DENR believes that the proposed monitoring and reporting requirements will ensure air emissions are minimized and does not recommend any changes to the draft PSD air quality permit as a result of these comments.

117. A group of individuals requested the reporting be submitted sooner and verified by a third party.

Response: The individuals did not specify which reports the comments were based on, did not identify a reason why the timelines listed in the draft PSD air quality permit were not sufficient, and did not identify why a third party is required to review the reports. DENR revisited the reporting timelines to verify if the general statement was accurate. DENR considers the timelines for the reports sufficient in demonstrating compliance with the draft PSD air quality permit. For example, the reports for continuous emission monitoring systems under the federal regulations are submitted either quarterly or semiannually. DENR required these reports to be submitted quarterly. The reports for the flare minimization plan involving the refinery flares are required to be submitted within 15 minutes after a flare event occurs, within 24 hours after a flare event ends, and within 45 days after a flare event ends. Once the reports are submitted, DENR will review each report to ensure Hyperion is in compliance with its PSD air quality permit. In addition, the reports are available for the public to review.

DENR concluded that the reports are required to be submitted in a timely manner and a third party (public and interested parties) has an opportunity to review the reports once the reports are received by DENR.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

118. One individual requested permit conditions 1.5, 3.1, 3.6, 3.7, and 3.8 not only be maintained by Hyperion but also by a third party. The individual believes it is a conflict of interest for Hyperion to be the only entity to maintain the records.

Response: The individual that requested a third party be used to maintain duplicate records was concerned that the records could be modified to falsely represent the actual operations if only one set of records were maintained by Hyperion. DENR believes this is unnecessary because inspectors are able to review all records pertinent to determining compliance with the draft PSD air quality permit and compare the records to the reports to ensure both are consistent and demonstrate compliance. Falsification of records is not only a violation of the draft PSD air quality permit under permit condition 1.2; but it is also criminal. Permit condition 3.1 specifies that Hyperion is required to maintain all records pertinent to the draft PSD air quality permit for five years. A third party (public or interested party) already has the right to review records and reports in DENR's files. DENR concluded that records maintained by a third party are not necessary.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

119. One individual requested permit conditions 3.4 and 3.5 of the draft PSD air quality permit be revised to require initial notification of construction and initial notification of startup 90 days in advance of the event. The individual is concerned construction or operation may occur prior to other required permits being obtained and for giving the state and public and opportunity to determine if the proposed activity is legal.

Response: Permit condition 3.4 requires Hyperion to submit an initial construction date notification for the purpose of determining if Hyperion is in compliance with its draft PSD air quality permit. Permit condition 2.1 requires Hyperion to commence construction within 18 months of the issuance of the draft PSD air quality permit. Permit condition 3.5 requires Hyperion to submit an initial startup notification also for the purpose of determining compliance with the permit. Permit condition 2.2 requires Hyperion to submit an application for a Title V air quality permit within 12 months of initial startup.

Requiring Hyperion to submit an initial report prior to the event occurring would mean that Hyperion would need to estimate these dates. DENR is requesting the actual date to ensure compliance with the permit and therefore required the notification within 15 days of the event.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

120. One individual was opposed to non-monitored emissions and self-monitored emissions.

Response: The draft PSD air quality permit requires a variety of method of monitoring emissions ranging from the measuring of emissions from a stack on a periodic basis, continuously monitoring the emissions from the stack, monitoring parameters to ensure the equipment is working properly, checking for leaks on a regular basis, and so forth. All of these measures are designed to ensure Hyperion is maintaining it operations in compliance with the draft PSD air quality permit.

In addition, DENR is establishing ambient air monitoring stations upwind and down wind from the operations. The monitors will be measuring the background air quality before construction begins, during construction, and during the operation of Hyperion. The ambient air monitoring data will provide us with information on which to gauge if Hyperion is operating in compliance with the draft PSD air quality permit.

Yes, Hyperion will maintain a self-monitoring program which will be reviewed by state inspectors to ensure compliance with the draft PSD air quality permit. The reports DENR receives is also open for review by third parties and if any additional information is

required by DENR to determine compliance, DENR has the authority to request this information from Hyperion. Therefore, there are many mechanisms in place to ensure compliance.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

121. On pages 65 and 67 of the draft PSD air quality permit, permit condition 11.1 requires the use, for each of several combustion sources, of either a continuous emissions monitoring system (CEMS) for exhaust gas sulfur dioxide concentration or a continuous monitoring system for refinery fuel gas hydrogen sulfide concentration. Hyperion recommends several revisions to this permit condition: a) Permit condition 11.1 requires each sulfur dioxide CEMS meet the performance specifications in appendix A to 40 CFR Part 75 and the quality assurance requirements in appendix B to 40 CFR Part 75. Hyperion believes this requirement is redundant, unnecessary, and inappropriate. Hyperion states each of the fuel gas combustion units and sulfur recovery plant thermal oxidizers in Table 11-1 is an affected facility under Subpart Ja of 40 CFR Part 60, which requires adherence to the performance specifications in appendix B to 40 CFR Part 60 and the quality assurance requirements in appendix F to 40 CFR Part 60 for each monitoring device. Hyperion recommends the reference to part 75 monitoring system requirements for all units subject to subpart Ja should be replaced with reference to part 60 monitoring system requirements. b) Table 11-1 indicates the wastewater treatment plant catalytic oxidizer is subject to the monitoring requirements in permit condition 11.1. Hyperion recommends the permit condition should be revised to clarify that vapors from the wastewater treatment plant are not "fuel gas" for the purposes of this permit condition. In addition, Hyperion states Table 11-1 describes this control device as a thermal oxidizer; but it is more accurately described as a catalytic oxidizer, as noted in Table 1-1 of the draft PSD air quality permit. c) Table 11-1 indicates the tank farm thermal oxidizers are subject to the monitoring requirements in permit condition 11.1. Hyperion recommends the reference to these thermal oxidizers should be deleted entirely. In the alternative, Hyperion recommends the permit condition should be revised to clarify vapors from storage tanks are not "fuel gas" for the purposes of this permit condition. d) Table 11-1 of this permit condition indicates a hydrogen sulfide CEMS is required for the power island acid gas removal system. Hyperion believes this is inconsistent with the text of permit condition 11.1, which provides only for a continuous monitoring system for "total sulfur in the fuel gas being burned." Hyperion suggest the power island acid gas removal system CEMS requirement be deleted from permit condition 11.1 and be moved to a new permit condition 11.4. Hyperion further suggests the new permit condition for the power island acid gas stream, not a fuel stream; the monitored pollutant is hydrogen sulfide, not total sulfur: and the applicable performance specifications are those in appendix B to 40 CFR part 60.

Response: The specifications for the sulfur dioxide and nitrogen oxide continuous emission monitoring systems are different between 40 CFR part 60 and 40 CFR part 75.

For example, the relative accuracy performance specification requirement under 40 CFR Part 60 Appendix B, Specification 2 section 13.2 is 20 percent. Whereas, the relative accuracy performance specification requirement under 40 CFR Part 75 Appendix A section 3.3 is 10 percent. In addition, 40 CFR Part 75 establishes procedures to estimate emissions in cases where something occurs to the continuous emission monitoring system, whereas 40 CFR Part 60 does not. DENR considers the continuous emission monitoring system requirements under 40 CFR Part 75 more stringent and detailed than 40 CFR Part 60. Therefore, DENR does not recommend any changes to the draft PSD air quality permit as a result of that portion of the comment.

DENR agrees the description of the control device for the wastewater treatment plant is a catalytic oxidizer and not a thermal oxidizer and will revise several sections of the draft PSD air quality permit to note the correct description.

In regards to the hydrogen sulfide continuous emission monitoring system for the power island acid gas removal system, permit condition 11.1 does identify the continuous emission monitoring system is for hydrogen sulfide in a footnote. However, DENR does agree it would be easier to follow if a new condition in regards to this unit was developed instead of trying to use the footnote. DENR will remove the "Power island acid gas removal system" and footnote 1 from Table 11-1 and add permit condition 11.4 to the draft PSD air quality permit addressing the continuous emission monitoring system for the power island acid gas removal system.

122. On pages 67 and 68 of the draft PSD air quality permit, permit condition 11.2 requires the use of a nitrogen oxide CEMS for several fuel gas combustion units and requires that each CEMS meet the performance specifications in appendix A to 40 CFR part 75 and the quality assurance requirements in appendix B to 40 CFR part 75. Hyperion believes this requirement is redundant, unnecessary, and inappropriate. Each of the fuel gas combustion units in Table 11-2 is an affected facility under Subpart Ja of 40 CFR part 60, which requires adherence to the performance specifications in appendix B to 40 CFR part 60 and the quality assurance requirements in appendix F to 40 CFR part 60 for each monitoring device. Hyperion recommends that the reference to part 75 monitoring system requirements for all units subject to Subpart Ja be replaced with reference to part 60 monitoring system requirements.

Response: The specifications for the sulfur dioxide and nitrogen oxide continuous emission monitoring systems are different between 40 CFR part 60 and 40 CFR part 75. For example, the relative accuracy performance specification requirement under 40 CFR Part 60 Appendix B, Specification 2 section 13.2 is 20 percent. Whereas, the relative accuracy performance specification requirement under 40 CFR Part 75 Appendix A section 3.3 is 10 percent. In addition 40 CFR Part 75 establishes procedures to estimate emissions in cases where something occurs to the continuous emission monitoring system, whereas 40 CFR Part 60 does not. DENR considers the continuous emission

monitoring system requirements under 40 CFR Part 75 more stringent and detailed than 40 CFR Part 60.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

123. On page 84 of the draft PSD air quality permit, permit condition 14.13 requires successful repair of a leaking heat exchange within seven days after detection, with no provision for delay of repair in the event that a process units shutdown would be required or in the event of unavailability of parts necessary for repair. Section 7.1.4.8 of DENR's Statement of Basis indicates its BACT determination for volatile organic compound emissions from the cooling water system is based on the work practices imposed in the expired PSD permit for the Arizona Clean Fuels Yuma refinery, but permit condition 14.13 in the draft PSD air quality permit does not provide for the delay of repair provisions that are provided in the Arizona permit, and DENR's Statement of Basis does not provide any basis for omitting any delay of repair provisions. Hyperion requests that the delay of repair provisions from the proposed revisions to subpart CC of 40 CFR Part 63, published in the Federal Register on September 4, 2007, be included in permit condition 14.14.

Response: On November 10, 2008, EPA published a supplemental proposed revision to 40 CFR Part 63, Subpart CC. In that supplement, EPA identified several criteria for when a delay in repair may occur. Generally, repairs are allowed to be delayed because a repair is not possible without shutting down process equipment. Shutting down a process system would generally release more emissions than would have happened if the leaking equipment remained in operation. DENR will revise permit condition 14.13 to include similar language as the proposed rulemaking involving the delay of repair.

124. Jenner & Block recommends the draft PSD air quality permit specify the standard operating procedures, how data will be validated and housed, the data handling and management aspects, and what steps will be taken to keep fugitive volatile organic compound emissions to a minimum.

Response: As noted in the application, the proposed BACT for leaking equipment such as pumps, valves, and compressors are the requirements in 40 CFR Part 63, Subpart H and CC, with noted exceptions. DENR included the requirement that Hyperion had to meet all the applicable requirements for 40 CFR Part 63, Subpart H and CC in Chapter 8.0 of the draft PSD air quality permit. To identify the differences in the leak definition and a limit on the number of equipment that may be leaking at one given time, DENR developed specific conditions noted in Chapter 14.0 of the draft PSD air quality permit. In reviewing the specific BACT limitations, it is not clear in the draft PSD air quality permit that these three items are considered BACT for leaking equipment. Therefore, DENR will revise the permit by adding permit condition 4.9 to the draft PSD air quality permit identifying BACT for equipment leaks is based on work practice standards.

Hyperion's application took into account a specific set of equipment would be considered leaking at any one given time. This assumption is based on the number of equipment that may remain leaking while waiting to be repaired. In permit condition 14.12 of the draft PSD air quality permit, DENR specifically identified Hyperion may delay repair of specific equipment as long as the total number of equipment leaking at any given time is less than the percentage listed in permit condition 14.12. The percentage limited in the permit is the same percentage Hyperion used in determining the number of leakers versus non-leakers in the application.

125. Jenner & Block recommends the draft PSD air quality permit be amended to include requirements for continuous ammonia slip monitoring on all selective catalytic reductions control combustion units to ensure excess ammonia will not be emitted.

Response: On May 16, 2008, EPA promulgated final rules in regards to the new source review program for PM2.5. In those rules (page 28325), EPA identified ammonia is not a regulated pollutant under the existing PSD regulations. EPA (pages 28327 and 28330) also identified "at this time there is sufficient uncertainty regarding whether certain precursors significantly contribute to PM2.5 concentrations in all areas such that the policy set forth in this rule does not presumptively require certain precursors (ammonia and volatile organic compounds) to be controlled in each area. However, the state or EPA may revise this presumption and regulate a precursor if it provides a demonstration on showing that the precursor is a significant contributor to PM2.5 concentration in the area". EPA went on to note if any state identifying ammonia emissions as a significant contributor to a nonattainment area's PM2.5 concentrations, or EPA's approval of a nonattainment State Implementation Plan doing so, does not make ammonia a regulated NSR pollutant for the purposes of PSD in any attainment or unclassifiable areas nationally.

DENR does not recommend any changes to the draft PSD air quality permit based on this comment.

126. EPA agrees with the BACT emission limits for the catalyst regenerative vents but is concerned that Chapter 10.0 (Performance Tests) gives the Secretary of DENR too much discretion on requiring performance tests. EPA is recommending DENR recite the basis for permit condition 10.1 and require Hyperion to conduct initial performance tests to demonstrate compliance with the BACT emission limits. EPA recommended DENR incorporate the sulfur dioxide concentration and the maximum flow rate from the regenerators' vents in the permit with monitoring and recordkeeping to demonstrate compliance with the proposed sulfur dioxide, carbon monoxide, and particulate matter BACT emission limits. EPA identified in Table 1-1 of the draft PSD air quality permit that the description for the catalyst regeneration vents may need to be revised to include the appropriate control device or practice for the catalyst regenerators based on the sulfur dioxide BACT analysis and review.

Response: ARSD 74:36:11:02 allows the Secretary to require a performance test to demonstrate compliance if the Secretary believes one is warranted. EPA's request DENR require initial performance tests to demonstrate compliance with the BACT emission limits is already specified in the draft PSD air quality permit. DENR is requiring Hyperion to conduct several initial performance tests as noted in permit condition 10.7 through 10.14. Permit condition 10.1 does not affect the requirements of those conditions. EPA is familiar with permit condition 10.1 since it is included in every permit and allows the Secretary the ability to require additional performance tests beyond those identified in permit conditions 10.7 through 10.14. DENR does not believe this is director's discretion but one tool of many DENR uses to ensure an owner or operator is in compliance with its air quality permit.

DENR included a pound per hour particulate matter, sulfur dioxide, and carbon monoxide emission limit on the catalyst regenerators in the draft PSD air quality permit. The pounds per hour emission limits effectively limit the potential to emit of the facility because it establishes a maximum amount the units can emit no matter what the flow rate is or the sulfur dioxide concentration. These limits effectively limit the potential to emit of these units and the stack testing requirement demonstrates compliance. Initial compliance with the particulate matter, sulfur dioxide, and carbon monoxide pounds per hour emission limits is based on the initial performance tests required in permit condition 10.7, 10.8, and 10.11, respectively.

In the application, the caustic scrubber was considered an integral part of the operations for the catalyst regenerators. The discussion on the lime scrubber, which would also be considered a caustic scrubber, was a review of an additional scrubber. DENR agrees by listing the caustic scrubber as a control device that this may lead to some confusion. Therefore, DENR agrees to revise the description of the catalyst regenerators in Table 1-1 of the draft PSD air quality permit to identify the caustic scrubber as an integral part of the system and revise the control device by removing caustic scrubber and identifying it as "not applicable".

127. Jenner & Block recommends the draft PSD air quality permit be amended to include requirements for continuous oxygen monitoring, flue gas flow rate, and fuel gas flow monitoring requirements for syngas and natural gas for each combustion turbine – duct burner combustion train and appropriate quality assurance and quality control; and Jenner & Block also recommends the installation of continuous flue gas volumetric flow monitoring in all sulfur recovery unit thermal oxidizer stacks to properly support continuous compliance assurance monitoring for all regulated pollutant emissions.

Response: Jenner and Block does not specify why the continuous oxygen monitor, flue gas flow rate, and fuel gas flow monitors should be required to supplement continuous emission monitoring data. The continuous emission monitoring system that records the emissions at the stack exit must meet the performance specifications in 40 CFR Part 75,

Appendix A and the quality assurance requirements in 40 CFR Part 75, Appendix B or the performance specification in 40 CFR Part 60, Appendix B and the quality assurance requirements in 40 CFR Part 60, Appendix F. The continuous emission monitoring systems that record the parts per million by volume sulfur, as hydrogen sulfide, in the fuel gases being burned shall meet the performance specifications and the quality assurance requirements in 40 CFR Subpart J or Ja. The performance specification and quality assurance requirements are specified in Chapter 11.0 of the draft PSD air quality permit.

DENR does not recommend any changes to the draft PSD air quality permit based on this comment.

15.0 Fugitive Emissions

15.1 **Dust**

128. On page 86 of the draft PSD air quality permit, permit condition 16.7 includes a reference to permit condition 16.7. Hyperion believes this is a typographical error and should be corrected to refer to permit condition 16.8.

Response: DENR reviewed the draft PSD air quality permit and agrees the reference in permit condition 16.7 should be a reference to permit condition 16.8. This change actually involves permit condition 16.2 through 16.7. DENR will revise the draft PSD air quality permit appropriately.

129. EPA disagreed with DENR's decision of proposing "work practice standards" as BACT for fugitive emissions and recommended DENR require all primary and secondary haul roads within and leading to the facility should be paved to protect the National Ambient Air Quality Standards. EPA noted there are operational limitations that were assumed in the modeling analysis that were not included in the draft PSD air quality permit and recommended they be included. EPA's examples consisted of specific units would operate limited hours per year and were not modeled as redundant operations.

Response: EPA does not cite any federal regulations or provide any real reason why they disagree with "work practice standards" as BACT for fugitive emissions. In fact, they appear to actually agree when recommending all roads in Hyperion's Energy Center and all primary and secondary haul roads should be paved.

EPA also did not provide any documentation that the requirement to pave all primary and secondary haul roads leading into Hyperion is necessary to protect the National Ambient Air Quality Standards. Hyperion is required by permit condition 5.4 of the draft PSD air quality permit to pave all roads within the property boundary of the energy center. The modeling Hyperion provided in the application and the draft PSD air quality permit based on Hyperion's application demonstrates the National Ambient Air Quality Standards and PSD increments are protected. The PSD air quality permit is constrained to Hyperion's

major stationary source as defined in 40 CFR §52.21. Even though EPA recommends all primary and secondary haul roads leading to the facility should be paved, the PSD air quality permit program rules do not give DENR the authority to require Hyperion to pave those roads outside the property boundaries.

EPA made a general comment in their "Fugitive Emissions BACT" that the operational restrictions assumed in the modeling analysis were not included in the draft PSD air quality permit. The modeling analysis assumes all roads with Hyperion's property would be paved which is a requirement in permit condition 5.4 of the draft PSD air quality permit. In addition, Chapter 5.0 of the draft PSD air quality permit identifies the operational limits assumed in the modeling analysis.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

130. Jenner & Block states Hyperion failed to conduct a required BACT determination for site road fugitive emissions and disagrees that allowing 20% opacity on site roads and parking lots constitutes BACT for fugitive road visible emissions. Jenner & Block also believe no outdoor unenclosed sulfur storage should be allowed.

Response: The PSD air quality permit program establishes the control technology, emission limits, recordkeeping, and reporting requirements that a facility must meet to protect air quality once the facility begins operations. The PSD air quality permit program does not cover emissions generated during the construction phase of the facility. Hyperion identified in its application the roads would be paved. DENR included permit condition 5.4 that requires all roads within Hyperion's center to be paved. DENR also included Chapter 16.0 to make sure the paved roads are properly maintained and emissions from the roads would be minimized.

Hyperion did not identify after operations begin it would have unpaved roads, open storage piles, waste pits, and the wash out concrete truck area. However, these types of fugitive dust sources will likely be present during the construction phase of the project and DENR included those conditions to minimize dust emissions during the construction phase of the facility.

The conditions in Chapter 16.0 are based on the Natural Events Action Plan for Rapid City. This Plan was designed to minimize dust emissions from fugitive dust sources such as paved roads, unpaved roads, and stock piles. This plan has been successful in helping the Rapid City area return to compliance with the National Ambient Air Quality Standard for particulate matter 10 microns in diameter or less. The Rapid City attainment designation was published in the Federal Register, dated March 6, 2006, and effective April 5, 2006. Therefore, DENR is confident these methods are able to minimize fugitive dust emissions.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

131. Hyperion and a group of commenters requested the roads and streets within the project should not remain unpaved for up to one year after initial startup. A group of commenters also requested there be requirements to control dust during the construction phase.

Response: In regards to controlling dust during construction, DENR already addressed this issue by including Chapter 16.0 of the draft PSD air quality permit, which requires Hyperion to minimize the dust generated on unpaved roads by applying a chemical stabilizer or water during the construction phase of the project. Therefore, the requirement to address dust during the construction phase has already been addressed.

As noted in the Statement of Basis on pages 153 and 159, the modeling analysis assumed the roads and streets would be paved during the operation of Hyperion. The modeling demonstrated once Hyperion began operations the facility would not cause or contribute to an exceedance of the National Ambient Air Quality Standards or PSD increments. DENR intended and agrees the roads and parking lots within the property boundary of the facility should be paved prior to initial startup and has revised permit condition 5.4 of the draft PSD air quality permit accordingly.

15.2 Volatile Organic Compounds

132. Jenner & Block claims there will undoubtedly be fugitive volatile organic compound emissions from the belt filter presses and sludge handling containers and equipment and no BACT analysis was conducted for these fugitive volatile organic compound emissions.

Response: Jenner & Block did not provide any documentation that supports the statement that there will be fugitive volatile organic compound emissions from the belt filter press and sludge handling system. DENR reviewed other BACT determinations for an oil refinery and/or IGCC facility and could not locate where fugitive volatile organic compound emissions from sludge handling were considered or mentioned. If Hyperion becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, that information is required to be submitted promptly for consideration.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

133. Jenner & Block states the application's facility process equipment component physical characterization and fugitive emission characterization is problematic and creates a low confidence that volatile organic compound BACT has been properly determined.

Response: Hyperion's application in Appendix C estimates the volatile organic compound emissions from a number of fugitive components such as valves, pumps, and compressors. The calculations are based on EPA's Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017). In the BACT analysis, Hyperion identified a percentage of fugitive components that could have leaks with repairs delayed. DENR established those percentages as operational limitations in permit condition 14.12 of the draft PSD air quality permit. Hyperion identified these percentages as the worse case scenario for components with a leak and estimated the emissions as if they were leaking at 10,000 parts per million. Hyperion then identified a number of components that would be leaking but at a level less than the leak detection level and estimated emissions as if they were leaking at 100 and/or 500 parts per million. Hyperion then estimated the emissions from the remaining components at the default zero classification.

As noted in 40 CFR §51.100(s)(2), compliance with an emission limit will be measured by the test methods in the approved State implementation plan or 40 CFR part 60, appendix A, as applicable. The method identified to determine compliance with the leak detection levels of 100 and 500 parts per million by volume is based on 40 CFR part 60 Appendix A, Method 21 as identified in 40 CFR §63.180.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

16.0 New Source Performance Standards

134. EPA recommended that permit condition 10.5 be revised to be consistent with permit condition 10.1 and include the New Source Performance Standards requirements that a test will not extend past a federally required performance test deadline.

Response: South Dakota is a rural state and currently has only one or two private testing firms that are able to conduct performance testing to comply with the testing requirements in the draft PSD air quality permit. Therefore, most testing is conducted by private testing firms from outside of South Dakota. Taking into account just the annual testing for the continuous emission monitoring system, the draft PSD air quality permit for Hyperion requires approximately one hundred performance tests per year. DENR has encountered instances where a performance testing team was unable to make a performance test due to a snowstorm or other issues. In addition, the performance tester often tries to coordinate the schedules for testing multiple facilities in one trip. DENR acknowledges these issues exist; and drafted the language to allow DENR to extend the deadline for these types of conditions. This is no different than EPA regulations under 40 CFR §§60.8(3) and 63.7(a)(4)(iii). According to 40 CFR §63.8(3), it states that the "The decision as to whether or not to grant an extension to the performance test deadline is solely within the discretion of the Administrator. The Administrator will notify the owner or operator in writing of approval or disapproval of the request for an extension as soon as practicable." According to 40 CFR §63.7(a)(4)(iii), it states that "The decision as to

whether or not to grant an extension to the performance test deadline is solely within the discretion of the Administrator. The Administrator will notify the owner or operator in writing of approval or disapproval of the request for an extension as soon as practicable." DENR believes, like EPA, it has the ability to extend a performance test deadline if the circumstances warrant.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

135. EPA mentioned it is in the process of reviewing two August 20, 2007, letters from RTP Environmental Associates Inc., which is an environmental consulting firm representing the Hyperion, that requests an applicability determination from EPA on the New Source Performance Standards under 40 CFR Part 60, Subpart J and Ja. EPA notified DENR that if EPA determines 40 CFR Part 60, Subpart Ja is applicable, the draft PSD air quality permit would need to be modified and the appropriate BACT limitations would need to be reviewed to ensure BACT limitations, at a minimum, meet the requirements in 40 CFR Part 60, Subpart Ja.

Response: On November 20, 2008, EPA Headquarters responded in writing to Hyperion's request for determination on specific new source performance standards. On June 24, 2008, EPA revised Subpart J and noted in 40 CFR §60.100(b) that the applicability of this subpart applied to petroleum refineries constructed after June 11, 1973 and before May 14, 2007. Hyperion's facility will be constructed after May 14, 2007, and will not be applicable to 40 CFR Subpart 60 Subpart J. However, Hyperion is still applicable to 40 CFR Part 60 Subpart Ja. DENR will remove permit condition 6.3 of the draft PSD air quality permit.

EPA stated subpart Ja applies to the IGCC power plant. A review of BACT limits for the IGCC power plant compared to 40 CFR Part 60, Subpart Ja notes the BACT limits are more stringent. Based on EPA's letter, DENR will revise permit condition 6.4 of the draft PSD air quality permit to identify the IGCC plant (Unit #50 through #64) is applicable to and must meet the requirements in 40 CFR Part 60, Subpart Ja. In DENR's original review of the BACT analysis, each of the new source performance standards were considered as the minimum requirement for BACT.

136. EPA noted the New Source Performance Standards identified in Chapter 6.0 of the draft PSD air quality permit did not specify the specific emission limits or compliance demonstrations for each applicable unit. EPA recommends DENR define the standards, compliance methods and testing requirements for each subpart for all of the emission units.

Response: DENR does not typically spell out the applicable limitation, work practice standards, compliance methods, etc. for each New Source Performance Standard in a preconstruction permit because the standards typically provide different options. Once

the owner or operator decides on an option, DENR then specifies the applicable limitation, work practice standards, compliance methods, etc. in a permit such as the Title V air quality permit. This is consistent with what DENR has done in other PSD air quality permits subject to a New Source Performance Standard. EPA has approved this method in the past and provides no justification based on federal regulations that their recommended change is required.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

17.0 Maximum Achievable Control Technology

137. One individual noted there are many toxins not addressed in the draft PSD air quality permit. Other individuals noted the draft PSD air quality permit only covers six of the toxins being released by the Hyperion project.

Response: The individual did not specify which toxins the draft PSD air quality permit did not address. The federal Clean Air Act requires the EPA to establish National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. EPA established six principal pollutants which are called "criteria" air pollutants. The six criteria air pollutants are: 1) particulate matter; 2) sulfur dioxide; 3) nitrogen dioxide; 4) carbon monoxide; 5) volatile organic compounds; and 6) lead.

The following is a list of regulated NSR pollutants under the PSD air quality permit program:

- Total suspended particulate (PM);
- Particulate with a diameter less than or equal to 10 microns (PM10);
- Particulate with a diameter less than or equal to 2.5 microns (PM2.5);
- Sulfur dioxide (SO2);
- Nitrogen oxides (NOx);
- Carbon monoxide (CO);
- Ozone measured as volatile organic compounds (VOCs);
- Lead;
- Fluorides
- Sulfuric acid mist;
- Hydrogen sulfide;
- Reduced sulfur compounds; and
- Total reduced sulfur.

The BACT limits in the draft PSD air quality permit consist of emission limits, operational limits, work practice standards, etc. to limit the emissions of particulate matter, sulfur dioxide, nitrogen oxide, carbon monoxide, volatile organic compounds, sulfuric acid mist and hydrogen sulfide. The total reduced sulfur and reduced sulfur

compounds are primarily composed of hydrogen sulfide. Therefore, these two regulated NSR pollutants are limited by the hydrogen sulfide limits.

In 1990, the United States Congress revised Section 112 of the Clean Air Act. Section 112 of the Clean Air Act established laws to regulate hazardous air pollutants. EPA identified 188 hazardous air pollutants and promulgated maximum achievable control technology standards to control these hazardous air pollutants. The Clean Air Act notes in Section 112(b)(6) that the PSD air quality permit program does not apply to hazardous air pollutants. Even though the hazardous air pollutants are not covered by the PSD air quality permit program, DENR included conditions in the draft PSD air quality permit requiring Hyperion to meet the applicable maximum achievable control technology standards.

The draft PSD air quality permit establishes emission limits, operational limits and work practice standards that will minimize the air emissions of the criteria air pollutants and hazardous air pollutants. For example, several of the hazardous air pollutants such as benzene are considered a volatile organic compound. The draft PSD air quality permit contains limits for volatile organic compounds and by controlling these volatile organic compound emissions, the draft PSD air quality permit will also limit many hazardous air pollutant emissions.

DENR believes hazardous air pollutants are addressed in the draft PSD air quality permit by requiring Hyperion to meet the applicable maximum achievable control technology standards and through volatile organic compound emission limits.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

138. EPA is unclear if DENR's has what EPA calls a "merged" permit that includes both Title V and PSD permit conditions in the PSD permit. EPA states if it is not a "merged" permit, the draft PSD air quality permit may not include emission limits for hazardous air pollutants because section 112(b)(6) of the Clean Air Act exempts hazardous air pollutant from PSD requirements. EPA states if it is a "merged" permit, DENR should clearly define the applicable limitations, work practice standards, testing, monitoring, reporting, and recordkeeping requirements of each applicable subpart. However, EPA concedes a Case-by-Case MACT determination can be included in the draft PSD air quality permit and is required for the process heaters; but was unable to determine if the process followed was under Section 112(g) or 112(j) of the Clean Air Act. EPA states the draft PSD air quality permit does not contain a case-by-case hazardous air pollutant limit for the process heaters. EPA also provided a reference to a recent EPA permit issued under 40 CFR Part 71, which is the Title V air quality permit program for EPA, for a case-by-case MACT determination for a gas-fired boiler.

Response: DENR's draft PSD air quality permit has not been merged with a Title V air quality permit. One method to verify this is actually in the draft PSD air quality permit. As noted in permit condition 2.2, Hyperion is required to submit a Title V air quality permit application to DENR within 12 months after beginning operation of the facility. As EPA noted and DENR identified in its Statement of Basis (page 39), Section 112(b)(6) of the federal Clean Air Act notes the PSD air quality program does not apply to hazardous air pollutants. Even though the hazardous air pollutants are not covered by the PSD air quality program, DENR reviewed the Maximum Achievable Control Technology (MACT) standards to determine which standards apply to Hyperion. DENR decided to include a condition in the permit identifying the applicable MACT standards to inform both the public and Hyperion these regulations would apply. Hyperion will have to meet these requirements regardless if they are in a PSD air quality permit or not. In addition, DENR is requiring the monitoring approaches identified in the some of these standards to demonstrate compliance with the BACT limits.

DENR does not typically spell out the applicable limitation, work practice standards, etc. for each MACT standard in a preconstruction permit because the MACT standards typically provide different options. Once the owner or operator decides on an option, DENR then specifies the applicable limitation, work practice standards, etc. in a permit such as the Title V air quality permit. This is consistent with what DENR has done in other PSD air quality permits subject to a MACT standard. EPA has approved this method in the past and provides no justification based on federal regulations that their change is required.

As EPA noted and identified in the Statement of Basis (page 40), the MACT standard under 40 CFR Part 63, Subpart DDDDD for the refinery heaters was vacated. The case-by-case MACT determination proposed by Hyperion was not for an existing facility or a source category. The case-by-case MACT determination was just for the Hyperion facility. Therefore, case-by-case MACT determination is covered by Clean Air Act requirements under 112(g) and not 112(j).

The requirements under 40 CFR Part 63, Subpart DDDDD were vacated due to issues regarding the term "solid fuel" and not the MACT determination and limits for large gaseous process heaters, such as those proposed by Hyperion. Subpart DDDDD does not contain a limit for hazardous air pollutants, but established an emission limit for carbon monoxide for large gaseous process heaters of 400 parts per million by volume, which is approximately 0.4 pounds per million Btus. As indicated by this MACT subpart and several other MACT subparts that were not vacated, the use of a surrogate emission standard to represent MACT is common.

As discussed in the Statement of Basis (page 40 and 41), the Case-by-Case MACT determination for the organic hazardous air pollutants was considered good combustion practices and propose to use carbon monoxide as a surrogate for organic hazardous air pollutants. The proposed BACT limit for carbon monoxide in the draft PSD air quality

permit is 0.007 pounds per million Btus and is more stringent than the MACT limit finalized by EPA in 40 CFR Part 63, Subpart DDDDD.

The Case-by-Case MACT determination for the metal hazardous air pollutants was also good combustion practices and particulate matter, which may contain trace metals, will be used as a surrogate. Since EPA did not establish specific limits for metal hazardous air pollutants in 40 CFR Part 63, Subpart DDDDD, the proposed BACT limit for particulate matter in the draft permit is 0.0075 pounds per million Btus and is more stringent.

The Case-by-Case MACT determination for the inorganic hazardous air pollutants (hydrogen chloride) was fuel gas scrubbing. Since EPA did not establish specific limits for inorganic hazardous air pollutants in 40 CFR Part 63, Subpart DDDDD, the proposed MACT limit for hydrogen chloride is more stringent.

Instead of using a specific hazardous air pollutant for the process heaters, DENR agreed with Hyperion that good combustion could be used and identified carbon monoxide and particulate matter limits as a surrogate similar to what EPA itself uses in some of the MACT standards they have promulgated.

In 40 CFR §63.6(f)(1), which is part of the general requirements of the MACT standards, it states the emission standards set forth in this part shall apply at all times except during periods of startup, shutdown, and malfunction. In 40 CFR §63.6(f)(2), it states compliance with emission standards are based on the results of the performance tests conducted in accordance with 40 CFR §63.7, unless otherwise specified in a specific subpart. Under 40 CFR §63.7(e) it states the performance tests shall be conducted under representative conditions. Operations under periods of startup, shutdown, and malfunctions shall not constitute representative conditions and exceedances of an emission limit during these periods are not considered a violation of the standard unless otherwise specified in a specific subpart.

Under 40 CFR §63.43(c)(2), Hyperion may obtain approval of its case-by-case MACT if the permitting authority follows the procedures outlined in paragraphs 40 CFR §63.43(f) through (h) or under any administrative procedure for preconstruction review and approval which provides for public participation. South Dakota's administrative procedures for obtaining a PSD air quality permit, which is a preconstruction permit, provides for public participation.

The Notice of MACT approval also met the requirements of 40 CFR §63.43(f) through (h). 40 CFR §63.43(f) specifies DENR must inform Hyperion if the application was complete and if it would approve or disapprove the determination. DENR considered the application complete on February 20, 2008. 40 CFR §63.43(g) requires MACT approval contain a MACT emission limit; include notification, operating, maintenance, performance testing, monitoring and reporting requirements. Permit condition 8.2 identified the emission limitations. Chapter 10.0 of the draft PSD air quality permit

identifies the testing requirements, which includes recordkeeping and reporting of the test results to DENR. Chapter 11.0 of the draft PSD air quality permit identifies the continuous emission monitoring requirements. Chapter 3.0 of the draft PSD air quality permit identifies the recordkeeping and reporting requirements. 40 CFR §63.4(h) identifies MACT approval must be submitted for public comment. DENR noticed the MACT approval as part of the public notice for the draft permit for Hyperion in four newspapers and placed the notice on our webpage and accepted comments on the permit and MACT approval for approximately 60 days. DENR followed the proper procedures for establishing a case-by-case MACT standard in a preconstruction permit.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

139. EPA requested DENR require Hyperion to comply with all the applicable requirements outlined in 40 CFR Part 63, Subpart UUU and specify each requirement in the permit.

Response: DENR indicated it would include MACT standards in the draft PSD air quality permit and required Hyperion to meet all the requirements of 40 CFR Part 63, Subpart UUU in permit condition 8.6 of the draft PSD air quality permit.

DENR does not typically spell out the applicable limitation, work practice standards, compliance methods, etc. for each Maximum Achievable Control Technology Standard in a preconstruction permit because the standards typically provide different options. Once the owner or operator decides on an option, DENR then specifies the applicable limitation, work practice standards, compliance methods, etc. in a permit such as the Title V air quality permit. This is consistent with what DENR has done in other PSD air quality permits subject to a Maximum Achievable Control Technology Standards. EPA has approved this method in the past and provides no justification based on federal regulations that this change is required.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

140. Jenner & Block states Hyperion fails to meet the Clean Air Act §112 requirements for characterizing and controlling hazardous air pollutants such as the mercury emissions from mercury in crude, petroleum coke and coal from both the refinery and IGCC, hazardous air pollutant emissions from flares, and other equipment.

Response: DENR already discussed why hazardous air pollutants are not considered a regulated NSR pollutant under the PSD air quality permit program. Jenner & Block is directed to Comment #137 of this document for that discussion.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

141. Jenner & Block alleges the Case-by-Case MACT analysis for the refinery heaters did not consider multiple hazardous air pollutants such as mercury, non-mercury metals, organic hazardous air pollutants, acid gases, dioxins, and radionuclides; used an improper surrogate in determining MACT; and did not consider startup, shutdown and malfunction operating scenarios.

Response: DENR already addressed a similar Case-by-Case MACT comment and would direct Jensen & Block to Comment #138 of this document.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

18.0 Compliance

142. Permit condition 1.7 identifies creditable evidence may be used to demonstrate compliance or noncompliance. One individual interpreted this permit condition as limiting the methods of determining compliance and prevented advancements of technology from being used to determine compliance.

Response: Permit condition 1.7 of the draft PSD air quality permit identifies creditable evidence as methods approved in federal regulations, a permit, a plan, and other testing, monitoring or information-gathering methods that produce acceptable data for determining compliance. DENR believes permit condition 1.7 gives DENR the flexibility it needs in determining if Hyperion is in compliance with its draft PSD air quality permit.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

143. Permit condition 1.4 on page 18 of the draft PSD air quality permit identifies a penalty amount of \$10,000 per day per violation, injunctive action, administrative permit action, and other remedies as provided by law. Some individuals stated the penalty amount of \$10,000 per day would not deter a company from violating its permit and recommend the penalty amount range from \$500,000 to \$5,000,000 per day.

Response: The \$10,000 per day penalty amount is the maximum amount currently allowed under the South Dakota Clean Air Act (SDCL 34A-1).

DENR does not recommend any changes to the draft PSD air quality permit based on these comments.

144. Jenner & Block recommends the draft PSD air quality permit include language allowing the computer models used to calculate emissions to be considered as credible evidence. In addition, Jenner & Block believes footnote 1 for Table 8-1 of the draft PSD air quality

permit implies other methods of demonstrating a violation are inapplicable and destroys the credible evidence rule.

Response: Permit condition 1.7 of the draft PSD air quality permit defines what DENR considers credible evidence in determining if a source is in compliance or in violation of its air quality permit. It identifies credible evidence as monitoring methods approved in federal regulations, compliance methods specified in an applicable plan, testing methods approved in federal regulations, and other testing, monitoring, or information-gathering methods that produce comparable information. DENR believes the description of credible evidence gives DENR and the public the ability to use other testing, monitoring, or information-gathering information to determine compliance provided it is credible.

Footnote 1 for Table 8-1 in the draft PSD air quality permit identifies how Hyperion will demonstrate compliance with the appropriate limits in Table 8-1. Permit condition 1-7 allows compliance with other testing, monitoring, or information-gathering information provided it is credible.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

19.0 Other Issues

145. One individual requested DENR establish a South Dakota Center for Environmental Advocacy to collaborate with Hyperion.

Response: The establishment of a South Dakota Center for Environmental Advocacy is not required under the PSD air quality permit program. However, the PSD air quality permit program and the other environmental programs administered by DENR ensure the environment in South Dakota will be protected and provide opportunities for public input.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

146. A group of individuals requested all pipelines and transportation systems be included in the draft PSD air quality permit.

Response: The draft PSD air quality permit covers specific air emissions as specified in the state and federal PSD air quality permit program. The pipelines and transportation systems (e.g. rail lines) are not covered by the PSD air quality permit because those systems are outside of Hyperion's property boundary.

The building of a pipeline would have its own approval process through the Public Utilities Commission. The process would be similar to what the TransCanada Keystone Pipeline went through to obtain its approval to build and involved public input.

The building of the rail line would be based on state and federal regulations administered by the South Dakota Department of Transportation.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

147. EPA noted if Hyperion has more than the threshold quantity of a regulated toxic or flammable substance as identified under 40 CFR Part 68, the facility must submit a Risk Management Plan to EPA that meets the requirements in 40 CFR Part 68 prior to the date the regulated substances are present in excess of the listed threshold quantities.

Response: DENR agrees Hyperion is likely to have more than a threshold quantity of a regulated toxic or flammable substance that will require a Risk Management Plan. To make sure this requirement is understood, DENR will add permit condition 2.3 to the draft PSD air quality permit requiring Hyperion to meet the requirements of 40 CFR Part 68, if applicable.

148. Jenner & Block states Hyperion's analysis of air impacts of hazardous air pollutants and the health risks resulting from these pollutants using EPA's Human Exposure Model-3 (HEM-3) is inadequate and requests copies of the input and output files Hyperion used in the analysis for review and comments.

Response: The modeling and report Hyperion developed using EPA's Human Exposure Model-3 was not required under the PSD air quality permit program. The reason hazardous air pollutants are not regulated under the PSD air quality permit program are specified in Comment #138 of this document.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

19.1 Environment Impact Statement

149. Some individuals and Jenner & Block recommended that the final PSD air quality permit should be delayed until an Environmental Impact Statement is completed.

Response: South Dakota Codified Law (SDCL) ch. 34A-9 establishes authority for a state agency, in its discretion, to require the preparation of an environmental impact statement concerning, among others, the agency's issuance of permits. SDCL 34A-9-3(5) specifically exempts from this statute, actions of an environmentally protective regulatory nature. Air quality permits are "actions of an environmentally protective regulatory nature" and are not an agency action for which an agency may require the preparation of an environmental impact statement.

DENR therefore cannot assess the fee associated with preparation of an environmental impact statement, as required by SDCL 34A-9-4, to the applicant. ("...Any agency which prepares, or has prepared by contract, an environmental impact statement pursuant to subdivision 34A-9-2(3) shall assess a fee against the person seeking a lease, permit, license, certificate, or other public entitlement for the preparation of the statement...."). Legal assessment of the cost of an environmental impact statement is dependant upon the existence of an agency "action". SDCL 34A-9-4, 34A-9-2.

Further, the procedural and substantive requirements for obtaining an air quality permit provide the agency information that is functionally equivalent to the relevant information that would be provided by an environmental impact statement. As discussed below, the information that can be considered in an air quality permit application is limited to that required by the air quality statutes and regulations. The regulations requires the submission of considerable substantive information concerning the impacts of the proposed facility on the ambient air, including the modeling of predicted impacts and the submission of alternative pollution control technology considered in the applicant's BACT analysis. The statutes and regulations set forth detailed procedures regarding the submission and consideration of comments from interested persons, the requirement that the agency respond to substantive comments received, and an adversarial hearing process that allows all interested parties to develop their positions and the agency to fully consider all information prior to taking action on the permit. Thus, orderly consideration of the relevant environmental factors associated with the issuance of an air quality permit, extensive opportunity for comment from the public and from interested persons, and additional opportunity for a quasi-judicial contested case proceeding and judicial review thereof, are all provided by the air quality permit application process. As a result, DENR does not believe that the preparation of an environmental impact statement would lend additional relevant information or process applicable to the pending air quality permit application proceeding.

The commenters assert that the preparation of an environmental impact statement would provide information that is not required to be provided in the air quality permit application, such as impacts of the proposed facility on noise, odors, road traffic, and regional infrastructure. However, these issues lie outside DENR's jurisdiction and authority to consider in an air quality permit application proceeding. The specific issues which DENR is authorized to consider in an air quality permit application proceeding are those set forth in the air quality statutes and regulations. While other permit application proceedings within DENR require consideration and determination of impacts of the proposed project on some of the other issues raised by the commenters, the air quality permit application proceeding does not. As a result, consideration of these issues in the air quality permit application proceeding would exceed DENR's authority. See, In the Matter of the Solid Waste Disposal Permit Application by the City of Sioux Falls, 268 NW2d 599, 600 (SD 1978)(consideration of siting issues not part of environmental requirements for a solid waste disposal permit established by applicable regulations, and agency's jurisdiction limited to specific requirements set forth in statute and promulgated

regulations.) Therefore, the information concerning these issues provided by any environmental impact statement would not be relevant to the pending air quality permit application.

SDCL ch. 34A-9 does not contain provisions identical to those of the federal National Environmental Policy Act, 42 USC 4321 et seq. However, it is instructive to consider how NEPA applies to federal agency actions taken under the federal Clean Air Act, 42 USC 7401 et seq. Congress has specifically exempted actions taken under the Clean Air Act from NEPA's requirements. See, 15 USC 793(c)(1), which states, "No action under the Clean Air Act shall be deemed a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969." This Congressional enactment was adopted in 1974; prior to that adoption, several courts had determined that actions taken under the federal Clean Air Act were not subject to NEPA because the substantive and procedural provisions in the Clean Air Act are functionally equivalent to, and provide materially identical protections as, those found under NEPA. See, Appalachian Power Co. v. EPA, 477 F.2d 495, 508 (4th Cir. 1973); Amoco Oil Co. v. EPA, 501 F.2d 722, 749-50 (D.C. Cir. 1974); Pacific Legal Foundation v. Andrus, 657 F.2d 829, 834 (6th Cir. 1981).

For these reasons, DENR did not require an Environmental Impact Statement. Previous correspondence from DENR on this topic is included in Appendix A of this document.

150. The National Park Service stated the opportunity for public comment associated with the PSD air quality permit procedures does not satisfy requirements for public participation under NEPA should future federal involvement in the project necessitate compliance with NEPA.

Response: Federal actions required for this project are subject to applicable federal laws. The State's procedures are not a substitute for federal agencies' compliance with the federal laws applicable to them.

In addition, actions taken under the federal Clean Air Act are exempt from the federal NEPA requirements. Congress established in 15 USC 793(c) that actions taken under the federal Clean Air Act are not considered a "major Federal Action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969." As a result, federal actions undertaken as a result of the Clean Air Act are not subject to NEPA's public participation requirements. So, should the "future federal involvement" referenced by the commenter concern federal action under the Clean Air Act, NEPA provisions would not apply.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

19.2 Odor

151. Jenner & Block states DENR must regulate odors. A group of individuals also requested the draft PSD air quality permit address odors. In addition, one individual did not understand why DENR did not consider the alternative as required in SDCL 34-10. DENR believes the reference by the individual is a typographical error and should be reference to SDCL 34A-10.

Response: SDCL 34A-1-2(1) defines "air contaminant" to include "odorous substances". The substantive regulations throughout SDCL ch. 34A-1, however, state that the Board "may" classify air contaminant sources (SDCL 34A-1-11); "may" require the owner or operator of a source to maintain records (SDCL 34A-1-12); "shall" promulgate ambient air quality standards (SDCL 34A-1-15), which may not be any more stringent than companion federal regulations (SDCL 1-40-4.1); and "may" prohibit the installation, alteration or use of any machine or equipment that causes or contributes to air pollution or is intended to prevent or control the emissions of air pollutants without a permit (SDCL 34A-1-21). The statutes therefore grant the Board the *authority* to control the emission of "odorous substances"; the Board, however, must exercise that authority through the adoption of regulations pursuant to SDCL 34A-1-6. See, In the Matter of the Solid Waste Disposal Permit Application by the City of Sioux Falls, 268 NW2d 599, 600 (SD 1978)(consideration of issues not part of environmental requirements for a solid waste disposal permit established by regulations, and agency's jurisdiction limited to specific requirements set forth in statute and promulgated regulations.) The Board, absent rules concerning the regulation of odors, does not have authority to regulate or impose conditions in the draft PSD air quality permit regarding odors.

The Board of Minerals and Environment does not currently regulate the emission of "odorous substances" through its rules. It did regulate odors at one time: see 1974 ARSD ch. 34:10:11. However, this regulatory program was repealed and no longer exists. This repeal of the rules regarding the regulation of odors, under the rules of statutory construction, supports DENR's interpretation that odor can only be regulated by the agency when specific rules concerning odor regulation are adopted.

The commenter refers both to the State's public nuisance laws (SDCL ch. 21-10) and the State's Environmental Protection Act (SDCL ch. 34A-10) in support of its allegation that the Draft Air Quality Permit must regulate odor. The State's public nuisance laws in SDCL ch. 21-10, however, exempt actions taken under the express authority of a statute (as the air quality permitting regulations are) and further establish a sole remedy (abatement of a nuisance) that lies within the exclusive jurisdiction of the state circuit courts. The Board of Minerals and Environment and DENR do not have statutory authority to determine the existence of a nuisance and to order abatement procedures. In addition, a permitting action taken under authority of SDCL ch. 34A-1 and the regulations implementing that statute are actions taken under the express authority of law and a facility permitted in accordance with SDCL ch. 34A-1 and its regulations is

therefore not a public nuisance so long as its operation complies with the terms and conditions of SDCL ch. 34A-1, the regulations adopted thereunder, and any permit issued pursuant thereto.

The State's Environmental Protection Act (SDCL 34A-10) is a legal remedy act. It authorizes interested persons to file civil actions against polluting activities (SDCL 34A-10-1); allows interested persons to intervene in administrative and licensing actions that they allege cause pollution (SDCL 34A-10-2); and sets out a judicial process in court concerning the pollution claims (for example, SDCL 34A-10-5, 6, 7, 11). The substantive provisions of SDCL 34A-10-8 state: "In any such administrative, licensing, or other proceedings, as described in §34A-10-2, and in any judicial review thereof, any alleged pollution, impairment, or destruction of the air, water, or other natural resources or the public trust therein, shall be determined, and no conduct shall be authorized or approved which does, or is likely to have such effect so long as there is a feasible and prudent alternative consistent with the reasonable requirements of the public health, safety, and welfare."

SDCL 34A-10-9: "When the plaintiff in the action [the interested person alleging pollution] has made a prima facie showing that the conduct of the defendant [the applicant in a licensing proceeding] is polluting, impairing, or destroying the air, water, or other natural resources or the public trust therein, the defendant [applicant] may rebut the prima facie showing by the submission of evidence to the contrary."

SDCL 34A-10-10: "The defendant [applicant] may also show, by way of an affirmative defense, that there is no feasible and prudent alternative to defendant's conduct and that such conduct is consistent with the promotion of the public health, safety, and welfare in light of the state's paramount concern for the protection of its natural resources from pollution, impairment, or destruction. Except as to the affirmative defense, the principles of burden of proof and weight of the evidence generally applicable in civil actions in the circuit courts shall apply to actions brought under this chapter."

The provisions of SDCL ch. 34A-10 are triggered by the "filing of a pleading with the agency asserting that the proceeding...involves conduct which has the effect of polluting, impairing, or destroying the air, water, or other natural resources...". SDCL 34A-10-2.

The "pleading" referenced in this statute *must* refer to a formal pleading (such as a Petition for a Contested Case or a Petition to Intervene as set forth in ARSD 74:09) filed in a contested case proceeding, *not* comments filed on a draft permit. This interpretation is the only one that would allow the substantive provisions of SDCL 34A-10-9, and -10 to function: a burden of proof, a prima facie showing, rebuttal thereof, and affirmative defenses are specific evidentiary rules applicable to court and formal quasi-judicial contested case proceedings. Therefore, until a formal pleading in the contested case proceeding on this particular permit proceeding (which has already been initiated) is filed under SDCL 34A-10-2, the substantive provisions of SDCL ch. 34A-10 are not triggered.

It is assumed that the commenter will be filing such a petition; at that time, as part of the contested case proceeding on the air quality permit application, the provisions of SDCL ch. 34A-10 may apply.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

19.3 South Dakota Cancer Registry

152. Some individuals questioned what process and policy will be used to track and document the childhood leukemia rates.

Response: DENR requested information from the Department of Health in response to this question. The Department of Health informed DENR that the South Dakota Cancer Registry (SDCR) is the statewide cancer surveillance system within the Department of Health. The SDCR complies with national standards and is gold-certified by the North American Association of Central Cancer Registries (NAACCR). NAACCR has established measures for excellence in the areas of completeness of case ascertainment, quality of data, and timeliness for central cancer registries.

The SDCR obtains cancer surveillance data in accordance with South Dakota law effective July 1, 2005, SDCL 1:43, which requires all facilities to report cancer diagnoses to the Department of Health. For each reportable cancer case diagnosed or treated in South Dakota, the SDCR collects data including patient demographics, medical history, diagnosis, stage of disease, laboratory and imaging services, and surgical or other methods of treatment.

Data are used to monitor the incidence and mortality of cancer to detect potential public health problems; provide descriptive data on cancer incidence and mortality to health professionals and the general public about risks, prevention, and early detection of cancers known to be elevated in their communities; guide decisions about using public funded cancer control resources to target intervention resources for communities, patients and families; and respond to public concerns.

Statistics for South Dakota cancer data are available in numerous ways. The SDCR participates annually in national calls for data, which allows for the availability of South Dakota data through the following online query systems: 1) NAACCR http://www.cancer-rates.info/naaccr/; 2) Centers for Disease Control and Prevention National Program of Cancer Registries http://apps.nccd.cdc.gov/uscs/; 3) National Cancer Institute (NCI) http://statecancerprofiles.cancer.gov/; and 4) NCI Surveillance Epidemiology and End Results http://seer.cancer.gov/statistics/. The SDCR website http://seer.cancer.gov/statistics/. The SDCR website http://doh.sd.gov/SDCR/ offers publications and the SDCR also accepts ad hoc data requests for more specific information.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

19.4 Greenhouse Gases

153. One individual stated that methane is a regulated NSR pollutant because it is a volatile organic compound which is a precursor to ozone and should be included in the draft PSD air quality permit.

Response: In accordance with ARSD 74:36:01:01(77), "volatile organic compounds" is defined as any compound of carbon which participates in atmospheric photochemical reactions, excluding certain compounds that do not participate in atmospheric photochemical reactions. Methane is one of the many compounds that are excluded from being a volatile organic compound as defined in the state and federal regulations.

DENR does not recommend any changes to the draft PSD air quality permit as a result of this comment.

154. Jenner & Block, Plains Justice, and some individuals state carbon dioxide is a regulated NSR pollutant which requires a BACT analysis.

Response: On pages 49 and 50 of the Statement of Basis, DENR identified carbon dioxide is not a regulated pollutant under the current PSD regulations. The Statement of Basis also discusses the specific reasons why the new source performance standard for landfills and monitoring requirements under section 821 of the Clean Air Act do not qualify carbon dioxide as a regulated pollutant under the PSD program. The commenters note carbon dioxide is considered a regulated pollutant because it is subject to the Clean Air Act State Implementation Plans of Delaware, Wisconsin, and Michigan and the Fiscal Year 2008 Consolidated Appropriations Act, H. R. 2764, Public Law 110-161 (Enacted December 26, 2007).

In accordance with 40 CFR §52.21(b)(50), a "regulated NSR pollutant" means the following:

- (1) Any pollutant for which a National Ambient Air Quality Standard has been promulgated and any constituents or precursors for such pollutants identified by the Administrator (e.g., volatile organic compounds and NO_X are precursors for ozone);
- (2) Any pollutant that is subject to any standard promulgated under section 111 of the Clean Air Act (Act);
- (3) Any Class I or II substance subject to a standard promulgated under or established by Title VI of the Act; or
- (4) Any pollutant that otherwise is subject to regulation under the Act; except that any or all hazardous air pollutants either listed in section 112 of the Act or added to the list pursuant to section 112(b)(2) of the Act, which have not been delisted pursuant to section 112(b)(3) of the Act, are not regulated NSR pollutants unless the listed

hazardous air pollutant is also regulated as a constituent or precursor of a general pollutant listed under section 108 of the Act.

The definition of a "regulated NSR pollutant" does not specify that a pollutant regulated by a State's State Implementation Plan or the Consolidated Appropriations Act makes that pollutant a regulated pollutant under the PSD program.

As noted by Jenner & Block, EPA has currently not determined if carbon dioxide will endanger public health and welfare nor has it developed federal regulations to regulate carbon dioxide. If EPA or Congress establishes regulations for carbon dioxide, South Dakota's air quality rules allow DENR to include and enforce new rules and regulations after they become promulgated and applicable.

Further, the South Dakota Public Utilities Commission (PUC) in issuing a siting permit for the proposed Big Stone II facility specifically found carbon dioxide emissions are not currently regulated. This decision was upheld by the South Dakota Supreme Court. The South Dakota Supreme Court on January 16, 2008, held the PUC followed existing legal guidelines in approving the permit, and its findings, including those regarding carbon dioxide emissions were not erroneous. *In the Matter of Otter Tail Power Company*, 2008 SD 5, ¶¶ 1, 35

DENR does not recommend any changes to the draft PSD air quality permit based on these comments.

155. Jenner & Block alleges Hyperion's application fails to provide any information on the emissions of hydrogen chloride, greenhouse gases other than carbon dioxide such as methane and nitrous oxide (N2O), or refrigerants or ammonia which may be used in the Rectisol Unit of the IGCC power plant.

Response: As noted in the Statement of Basis, hazardous air pollutants, carbon dioxide, and methane are not considered regulated pollutants under the PSD program. Hydrogen chloride is considered a hazardous air pollutant and as such is not regulated. As discussed in Comment #125 of this document, ammonia is also not a regulated pollutant under the PSD program. In regards to the classification of refrigerants, Hyperion is not manufacturing a refrigerant in its process and did not identify a refrigerant emission in its application.

DENR does not recommend any changes to the draft PSD air quality permit based on this comment.

19.5 Water Related

156. A group of individuals had concerns about a variety of water issues dealing with drinking water, wastewater treatment, water usage, surface water discharge, wetlands,

groundwater, and others. The individuals requested the water issues be considered in the draft PSD air quality permit.

Response: The draft PSD air quality permit covers specific air emissions as specified in the state and federal PSD air quality permit program. In areas such as the wastewater treatment facility which will emit volatile organic compound emissions generated from its process, the draft PSD air quality permit requires the use of a thermal oxidizer among other items to control air emissions. However, the draft PSD air quality permit program only gives us the authority to address air issues. The authority to address the water issues identified by the individuals such as storm water runoff, wetland mitigation, protection of surface and groundwater quality, water rights, etc. are covered under separate rules, regulations, and environmental permits. Although Hyperion is currently in the process of trying to obtain a PSD air quality permit, they still need to go through similar processes to obtain their other state and federal water permits.

DENR does not recommend any changes to the draft PSD air quality permit as a result of these comments.

APPENDIX A ENVIRONMENTAL IMPACT STATEMENT DENR CORRESPONDENCE



DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

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December 3, 2008

Robert L. Graham Jenner & Block LLP 330 N. Wabash Avenue Chicago, IL 60611

Re: Proposed Hyperion Energy Center

Dear Mr. Graham:

Thank you for your letter requesting that the South Dakota Department of Environment and Natural Resources (DENR) prepare an Environmental Impact Statement (EIS) for the proposed Hyperion Energy Center. In your letter, you referenced an earlier request for an EIS from Minority Leader Scott Heidepriem, South Dakota State Senate. DENR studied Senator Heidepriem's request at length before deciding not to require an EIS for this project (copy of DENR reply to Senator Heidepriem enclosed for your information). After carefully considering your request, DENR has once again come to the same conclusions.

While the reasons behind our original decision still stand, we need to disagree with the assertions made in your letter concerning the impact of the proposed Hyperion Energy Center on the environment and natural resources of the State of South Dakota. We also disagree with your assertions that other environmental concerns, such as water withdrawals, water use, groundwater, surface water, water quality, stormwater, waste disposal, wastewater, and spill response, will not be considered. While these issues are not addressed in the draft Prevention of Significant Deterioration preconstruction air quality permit that is currently under review, those other environmental issues will be fully considered when Hyperion complies with a host of other permitting and regulatory processes, such as a water right permit, discharge permits, waste disposal permit, etc., some of which are listed in the attached letter.

Finally, you reference both state and federal laws regarding Environmental Impact Statements. DENR is not bound by the federal National Environmental Policy Act (42 USC 4321 to 4370(f)) as it pertains to federal agencies. As for state law, please note the South Dakota Legislature in SDCL 34A-9-3 has specifically exempted "actions of an environmentally protective regulatory nature" from the "action" for which an EIS may be prepared. The permitting actions taken by DENR are exactly such exempted actions. As a result, DENR is not authorized to assess the cost

and fee of an EIS as contemplated by SDCL 34A-9-4 against the persons seeking the environmental permits.

As you are aware, the extended public comment period for the draft Prevention of Significant Deterioration air quality permit for the Hyperion facility recently closed. In response to DENR's public notice, we received comments from approximately 3,000 people and organizations (all comments are available on DENR's website at http://www.state.sd.us/denr/hyperion.htm). As we now study and analyze all this additional information, we remain confident the permitting processes authorized by the South Dakota Legislature will provide the most complete, detailed, and best information for making the environmental decisions over which DENR has jurisdiction. Thank you again for your letter.

Sincerely

Steven M. Pirner, P.E.

Secretary

Enclosure

cc: Roxanne Giedd, Deputy Attorney General



DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

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August 1, 2008

The Honorable Scott Heidepriem, Minority Leader South Dakota State Senate 503 East 21st Street Sioux Falls, SD 57105

Dear Senate Minority Leader Heidepriem:

Thank you for your letter encouraging the Department of Environment and Natural Resources (DENR) to require an Environmental Impact Statement (EIS) for the proposed Hyperion Energy Center. As you know, an EIS can be required at either the federal or state level. Actions that trigger a federal EIS may be the expenditure of federal monies or certain federal actions. For example, the U.S. State Department had to issue TransCanada a permit to enter the United States from Canada, and that action triggered a federal EIS for the Keystone Pipeline project. Therefore, a federal EIS may also be required for a pipeline bringing Canadian crude oil to the proposed Hyperion Energy Center.

As you wrote, there is a chapter (i.e. SDCL 34A-9) in state law authorizing a state EIS as well. However, to avoid duplication of effort, SDCL 34A-9-11 does not require a state EIS if a federal EIS is done. Another characteristic is the state EIS law is discretionary in nature and allows agencies to make a determination if an EIS is required. Finally, the law states that actions of an environmentally protective regulatory nature, such as environmental permits, are exempted and do not constitute an action triggering a state EIS.

Because DENR is authorized to function as a central, one-stop environmental permitting agency, there has never been a state EIS completed for DENR pursuant to SDCL 34A-9. However, this lack of Environmental Impact Statements is not to imply there is a lack of environmental information and evaluation such as you are seeking. Instead of an EIS, DENR uses its protective regulatory authorities to examine development projects through a myriad of environmental permitting and regulatory processes. For example, Hyperion will need to comply with the following environmental requirements from DENR:

- 1. Prevention of Significant Deterioration pre-construction air quality permit;
- 2. Title V air quality operating permit;
- 3. Water right permit;
- 4. Surface water discharge permit;
- 5. Storm water discharge permit;
- 6. Hazardous waste disposal requirements;
- 7. SARA Title III reporting;
- 8. Underground and above ground storage tank requirements;
- Drinking water regulations/standards;

- 10. Operator certification;
- 11. Engineering plans and specifications review and approval;
- 12. Ground water discharge permit; and
- 13. Permit for disposal of wastes.

It has been our experience that these individual regulatory reviews are more detailed and specific than an EIS. Consequently, we believe they provide more useful information for basing environmental decisions. For example, the application submitted by Hyperion for a Prevention of Significant Deterioration pre-construction air quality permit is 613 pages long. That does not even include the modeling analyses used to demonstrate South Dakota's air quality will be protected. Therefore, these permitting applications are detailed, subject to intense technical reviews that include evaluating alternatives such as identifying best available control technologies, and, like an EIS, are prepared at the applicant's expense as you suggest.

Another benefit of these individual regulatory reviews is the public can request administrative hearings regarding the outcomes. Unlike an EIS which cannot be administratively contested, the public has the right to contest environmental permits recommended by DENR. Once contested, DENR boards hold in-depth hearings to construct records that include information from all sides. For example, the Board of Minerals and Environment is currently hearing the draft air quality permits for the Big Stone I and II power plants. These applications and draft permits were public noticed by DENR, and subsequently contested by the Sierra Club and Clean Water Action. As part of those proceedings, the Board held a pre-hearing conference on March 20, 2008, to schedule depositions and the hearing; traveled to Big Stone to tour the existing power plant on July 16, 2008; held a meeting in Milbank on July 17, 2008, to hear public comments regarding the proposed permits; scheduled a week-long contested case hearing during August 18-22, 2008; and have scheduled a second week in September to finish the hearing if necessary. Again, all of this is for just hearing and making decisions regarding the proposed air quality permits. This scenario can be repeated for other permits involving other environmental media.

Because we agree with you that many people are interested in the Hyperion proposal and want to learn more about it, please find the enclosed press release which announced that DENR is making the permitting files available on its webpage at http://www.state.sd.us/denr/denr.html. For those without access to the Internet, DENR is also making a hard copy of these files available to the public at its Geological Survey Program offices located in the Akeley-Lawrence Science Center on the University of South Dakota campus and at our office in Pierre.

You also raised some specific concerns in your letter. For example, you wrote that Hyperion will produce about 19 million tons of carbon dioxide per year, but have no current plans to address these emissions. While we agree the energy center is projected to emit 17.2 million metric tons of carbon dioxide, the good news is the center will employ the latest technology in energy production called Integrated Gasification Combined Cycle, or IGCC, to generate power. The IGCC process not only has lower emissions when compared to other power technologies, but can capture carbon dioxide. Therefore, as the federal government begins working to regulate carbon dioxide emissions, the use of this technology will allow Hyperion to be ready to capture as much as 90 percent of the carbon dioxide from its power plant.

You also expressed concern about what seem like large amounts of air pollutants listed in Hyperion's air permit application. To put these figures in perspective, DENR developed the following table which is found in the "Questions and Answers" section of our Hyperion webpage

referenced above. The table shows the total amount of regulated pollutants coming from the plant will actually be less than the existing emissions occurring in Union County. For example, the carbon monoxide emissions from Hyperion would be only about 23 percent of the amount of carbon monoxide emissions EPA found in Union County during 2002, and only 4.5 percent of the carbon monoxide emissions occurring in Minnehaha County. Levels of most other pollutants will be less as well. In fact, if you total the emissions in the table, the potential emissions from Hyperion plus all the existing emissions in Union County are only 32 percent of the total emissions found in Minnehaha County. Because the air quality in Minnehaha County is good and meets all standards, by comparison the air quality in Union County will continue to be very clean as well, even with the energy center.

Hyperion Emissions versus Existing County Air Emissions found by EPA in 2002

(pollutants are in tons per year)

Pollutant	Hyperion Total	Union County Total	Union County Vehicles	Minnehaha County Total	Minnehaha County Vehicles
Particulate matter 10 microns in diameter or less	1,046	4,521	7	10,930	23
Particulate matter 2.5 microns in diameter or less	1,046	909	23	2,076	61
Sulfur dioxide	863	1,532	30	3,320	106
Nitrogen oxides	773	2,191	1,169	6,538	3,532
Volatile organic compounds	473	1,007	454	7,171	2,388
Carbon monoxide	1,999	8,853	6,728	44,346	30,027

^{1 –} For the modeling analysis, Hyperion assumed all particulate matter will be 2.5 microns in diameter or less. Therefore, the amount of particulate matter 10 microns in diameter or less will be equivalent to the amount of particulate matter 2.5 microns in diameter or less.

Finally, you wrote about the emissions listed in Hyperion's air permit application and questioned if emissions from flares are included. Potential emissions from flares are not included in these figures, but we agree flares need to be addressed. Therefore, DENR's air quality engineers are working to develop restrictions on the use of flares through the air permitting process. As for the potential wastewater and waste disposal impacts you mentioned, DENR will be addressing those as well when Hyperion applies for discharge and waste disposal permits.

In summary, we agree with you that to make the best and most informed decisions as the project proceeds, both DENR and the public need to know as much as possible about the proposed Hyperion Energy Center. We are confident the environmental permitting processes authorized by state law will provide the most complete, detailed, and best information for making those decisions. In addition, these permitting processes establish a record that public health and the environment will be protected. For all these reasons, I hope you can understand why DENR does not intend to require an EIS for this project. Thank you again for your letter.

Sincerely,

Steven M. Pirner, PE

Secretary